250 SHORT CUTS *for* BUILDERS

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250 SHORT CUTS FOR BUILDERS

A Collection of Practical, Tested Ideas and Methods for Laying Out and Erecting Different Branches of Builders' Work, Saving Time and Material in the Builders' Office, Shop and on the Job

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CONTRIBUTED BY

MANY EXPERIENCED PRACTICAL BUILDERS

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250 Short Cuts for Builders

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250 Short Cuts for Builders

Preface

IN these days of high labor costs and expensive materials, efficiency on every job is of vital importance. Any method, therefore, for saving time or material, actually cuts costs and insures a better profit for the building contractor.

During the past few years many a good building short cut was published in Building Age and National Builder giving the actual experience of some practical builder and explaining how he either saved time in doing a certain job or how he saved material by an improved way of working.

These practical experiences proved of considerable value to our readers and every year we receive many hundreds of requests for back copies containing a certain article. In most cases unfortunately we could not comply as all copies were sold.

Feeling sure that it will be a real help to builders we have compiled this book and it forms a collection of tried short cuts of practical builders from all parts of the United States.

The descriptions of these practical short cuts have been arranged here in groups, revised and edited so that the subjects continue in sequence. Short Cuts for practically every department of building construction are included and therefore we are confident that this book will be of immeasurable service to builders.

THE EDITORS

CHAPTER I

Short Cuts in Office Work

THERE is many a little kink that will save time in the builder's office and a number of them are presented here. One can waste as much time in the office as out in the field. Modern office furniture is, of course, a part of the up-to-date builder's equipment and every office should contain a good sized drawing board with all necessary tools and supplies. A plan cabinet with a number of drawers is a very valuable adjunct, each job having its own special drawer wherein all plans, specifications, etc., are kept for each job.

Plans That Can't Be Lost

1 Many and many a time plans have been lost and work delayed until a new set could be sent out from the office. This Cheyenne, Wyoming,

contractor, however, is taking no chances. As will be seen from the illustration, he has tacked the plans upon the wall, using a few strips of wood to hold them in place. Of course this means that whoever wishes to consult the plan must come to the place where the plan is located but considering the fact that everyone on the job knows where he can find the plan, this is not as great a disadvantage as it may appear.

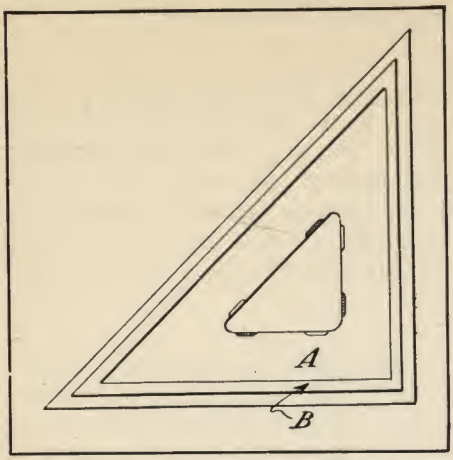
For Carrying Blue Prints

2 Quite often blue prints or specifications are lost while being carried back and forth from job to office or to the mill. If you use a cardboard tube to hold the drawings, always take the precaution of running a string through it and tying same, so that the drawing can have no chance of slipping out. When putting specifications inside of the roll of plans, do not roll them up separately or they are liable to slip out. Roll them in with the plans, then they will lie securely. Use plenty of rubber bands, or better, use a piece of paper on the outside, as then they will not tear through.

A Tracing Safe-Guard

3 The most dangerous man to box with is a novice and an amateur wood chopper is one to give distance to. So a man who seldom needs to trace, but sometimes has to, should

resort to any means to protect his work. W. M. provides the following suggestion:



In figure, A presents a triangle and B a strip of blotting paper. This strip should be about ¼ in. wide and glued to the triangle about ¼ in. to ⅛ in. from the edge. If a piece like this is placed on each side it will be found a great help when inking because the ink will not be able to run, and if the triangle is laid on fresh ink it will not spoil the line. Try it and see the difference when inking.

Blue Print Shrinkage

4 Trouble may arise from scaling blue prints. A. L. explains that recently he had occasion to lay out some work for a convention exhibit. The ceiling of the hall was supported by mushroom type concrete columns at uniform but irregular intervals, and the space covered measured about 175 by 300 feet.

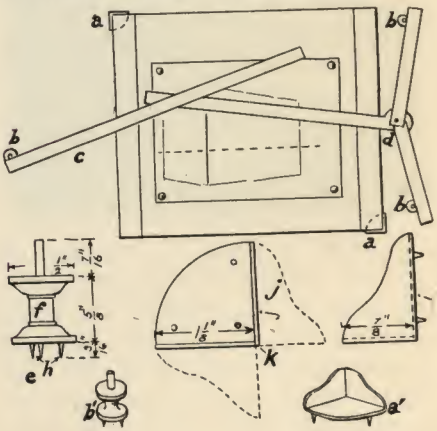
The booth spacing had been decided on and he regretfully turned over the job of marking the spacings to a girl clerk without explaining that the tracing had been made over a blue print. Unfortunately, that was the last he heard or saw of the job until the work was well under way. Due to the shrinkage of the blue print the tracing was short both ways.

The young lady had laid out the space accurately with a scale. Of all the infernal messes one could find, it was the worst. There seemed to be twice as many columns as existed and everyone seemed to be an obstacle. This may have been a specially bad case, but don't ever scale a blue print.

Ordinarily a blue print will shrink about ¼ inch for every three feet. Tracing cloth is also guilty in this respect, as is indicated by its crawling or buckling when tacked onto the drawing board. The accumulated error may therefore be considerable.

A Drawing Board Attachment

5 The illustration below, shows a device for clamping a drawing board in place. Sometimes it is very convenient to take up a perspective sketch from the table, for some freehand work to be done upon it, or for any other purpose, and then return it to its proper place on the table for completing the perspective lines without relocating the vanishing points.



This apparatus was made for use in making drawings upon the block for wood engraving; but it is equally well adapted to hold small boards fixed in place on the drawing table. There are two corner pieces shown in place on the board at (a_1, a_2) and, alone, at (a_2). Also three perspective vanishing points, as shown at (b_1, b_2, b_3) and in perspective at (b_4). The straight edge (c) and the centro-line at (d) in the illustration are in place, resting upon these points.

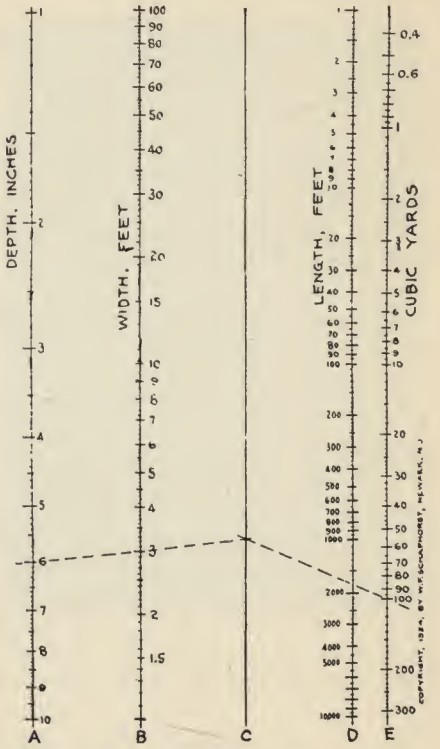
The detail of one of the perspective points is shown at (e) in plan and elevation. The body or spool (f) is made of brass. It should be nearly as high as the thickness of the board. The steel pin is firmly fixed in a hole drilled in the center of the spool, and three small steel points are inserted at (h). The detail of the corner pieces is shown at (i) in elevation and at (j) in plan. This is made of thin brass sheet cut to the shape by the dotted lines in (j). The sides are bent up and soldered at the angle (k).

To use these attachments the board is first located upon the large board or table and in a convenient position for work and the corner pieces firmly fixed under the two corners. After locating the vanishing points on the horizon set the metal points firmly as bearings for the straight edges. The small board can be then lifted and returned to the table at convenience.

Convenient Yardage Scale

6 Very often it is desired to compute the number of cubic yards in long, narrow, shallow excavations. The depth is then usually given in inches and the width and length in feet. The chart herewith has been developed primarily to take care of excavations of that kind. The depth, column A, is given in inches, while the width, column B, and length, column D, are given in feet. Simply run two zigzag lines across the chart as indicated by the dotted lines and the number of cubic yards is instantly given in column E.

For example, the dotted lines drawn across the chart show that if we have an excavation 6 inches deep (column A) by 3 feet wide (column B) and



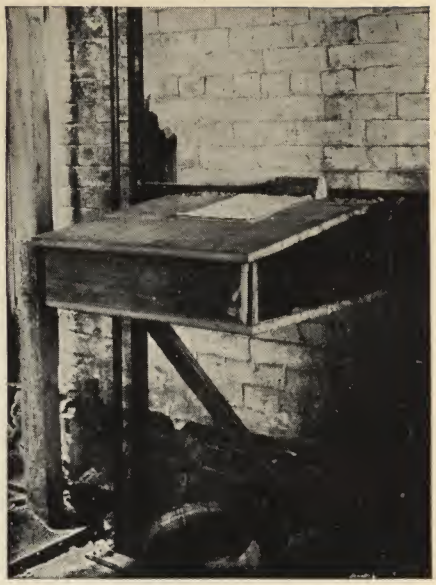
1800 feet long (column D), the number of cubic yards will be found to be exactly 100. Merely run a straight line through the "6," column A, and the "3," column B, and locate the intersection in column C. Then from that point of intersection run through the "1800," column D, with another straight line and the intersection with column E gives 100 cubic yards.

An Inexpensive Superintendent's Desk

7 On every job it is necessary to have some place where the superintendent can do his writing and planning and on small jobs, where the size does not warrant the erection of an office shanty, the National Construction Company of New Haven, Connecticut, sets a desk in some convenient spot in the building.

Note that the desk shown here is not a costly mahogany affair such as one finds in offices but simply a rough, on-the-job piece of furniture thrown together from a few short pieces of boards. The top is hinged and it may be lifted to gain access to the storage space. The desk is supported from below by a brace and is nailed to a cleat which is fastened to the wall.

The cost of such a desk is very small indeed and it may be easily removed from one job to another and fastened in place without difficulty.



Calculating Length of Hips and Gables

8 The accompanying tables, submitted by John P. Marinelli, give an accurate method of computing the length of gable rafters and various types of hips for the different roof pitches. In each case the number of feet of the run is to be multiplied by the figure given in the table for the corresponding pitch.

Thus, for a 5/6 pitch roof with a 20-foot run, the length of the run is to be multiplied by 1.9433 (see table) to get the length of the gable rafter. For a hexagonal hip, the length of the run multiplied by 2.0311 will give the total length of the hip. For an octagonal hip, multiply by 1.9878. In every case use the run in feet.

ROOF PITCHES	20 ft. 5/6	19 ft. 19/24	18 ft. 3/4	17 ft. 17/24	16 ft. 2/3	15 ft. 5/8	14 ft. 7/12	13 ft. 13/24	12 ft. 1/2
Gable Rafter	1.9433	1.8733	1.8033	1.7342	1.6767	1.6008	1.5367	1.4825	1.4142
Hip or Valley	2.1858	2.1229	2.0615	2.0017	1.9446	1.8875	1.8333	1.7815	1.7321
Hexagonal Roof Hip	2.0311	1.9661	1.8884	1.8307	1.7682	1.7056	1.6458	1.5833	1.5313
Octagonal Roof Hip	1.9878	1.9185	1.85031	1.7834	1.7179	1.6541	1.5920	1.5321	1.4743

ROOF PITCHES	11 ft. 11/24	10 ft. 5/12	9 ft. 3/8	8 ft. 1/3	7 ft. 7/24	6 ft. 1/4	5 ft. 5/24	4 ft. 1/6	3 ft. 1/8
Gable Rafter	1.3566	1.3017	1.2500	1.2019	1.1577	1.1180	1.0833	1.0541	1.0308
Hip or Valley	1.6853	1.6475	1.6008	1.5635	1.5298	1.5000	1.4743	1.4530	1.4361
Hexagonal Roof Hip	1.4766	1.4271	1.3802	1.3359	1.2969	1.2604	1.2292	1.2057	1.1693
Octagonal Roof Hip	1.4191	1.3668	1.3176	1.2720	1.2304	1.1932	1.1607	1.1335	1.0859

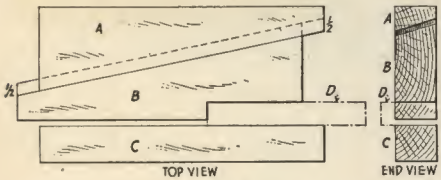
CHAPTER II

Short Cuts in the Shop

THE shop is a most valuable adjunct to the live building contractor's business as it is here that all special mill work, etc., is made. Thanks to modern machine manufacturers, equipment for performing all sorts of work excellently and thoroughly can be had. Here are a few hints giving some shop short cuts that will save you money.

A Handy Benchstop

9 Here is an easy method of making a bench stop that J. W. Cooper recommends for holding tightly any piece of lumber you are planing. A



board, 7/8 x 3 inches and five or six feet long will do. First rip off a length (c) about 3/4 inch wide the length of the board. Then rip the remainder of the board from corner to corner on a level as shown by A and B. Nail A and C to the bench as the frame for your vise.

Then cut a notch in one of B wide enough for any ordinary board you may have to plane. Place B in the space left between A and C, and set the piece you wish to work D in the notch. The harder you push the tighter it holds.

Improving the Screwdriver

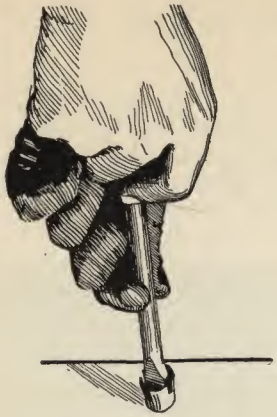
10 What workman has not damaged the piece he was carefully finishing because the blade of the screwdriver slipped from place and sank into the sandpapered surface of

the wood? By going slowly and carefully the screw can be placed without mishap. But when the rush job comes along—then you will need a guard such as is shown in the illustrations.

Secure an empty revolver shell large enough to fit over the screw head. Drive a round stick into it and set head up in the vise. Cut a notch about 1/4 inch deep in the center of the head and spread it slightly with a cold chisel until the screwdriver blade fits easily and snugly into it.

Only about one-half inch of the shell is needed. This is slipped onto

the screwdriver blade when the screw is started and left in place until the screw is nearly in.



If properly made it is impossible for the blade to leave the screw head. To insure this, however, the guard should come a trifle below the end of the blade when in place.

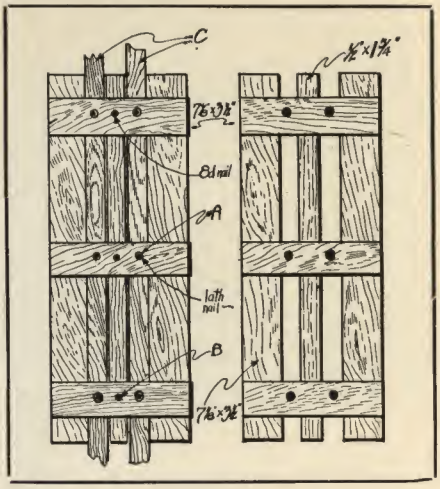
Making a Template

11 The following method is suggested for making a template to be used in erecting ground strips beside door openings in partitions that are to be plastered. It will accomplish the purpose for both strips at one operation and will result in an absolutely accurate job.

The jambs are 5¾ inches across and the template is 5⅝ inches, providing the proper allowance for ⅛ inch shrinkage which usually takes place during the application of the white coat. The template is made of two outside and cross pieces ⅞ x 3½ inches, with the center piece the same as the ground strips.

As seen in the drawings, the ground strips are ½ x 1¾ inches in size.

The ground strips are fastened to the template in charging by lath nails, and when the strips are secured to the studding the template is pulled loose, and the 8d nails pulled back but not out, as the same nails will do for many openings. The lath nails remain in the ground strips and are hammered down.



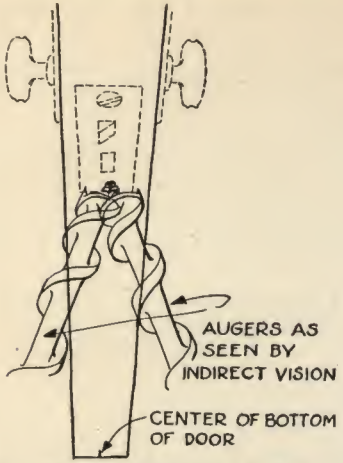
The Octagon and Double Vision

12 The octagon cut marked in the center of the tongue of the square is not well located for measuring purposes, claims E. R. McC. of Indianapolis; he has always regarded the tri square, set at an angle of 22½ degrees, as being much the better instrument to locate corners of an octagon.

As a further hint to builders he cites the case of the mechanic who spoiled two doors and had nearly finished a third before admitting that his bit was not made properly.

Perhaps a helping hand would not be amiss to those who are not yet adepts at this class of work. The bit was a very good one so E. R. McC. showed him that, by standing directly in front of the door and by fixing his eyes intently on the center of the bottom of the door, his indirect vision would

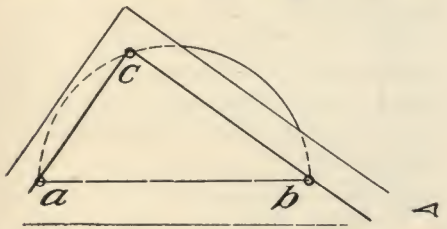
show two augers instead of one boring into the door. Then if he would maneuver so as to keep the bottom



of the door equidistant between the two bits of his double vision he would never 'bore out' through the side of the door, but would surely bore straight in.

Squaring the Circle

13 Those who have read "The Anatomy of Melancholy," will remember that the old timers in science divided their spare time be-



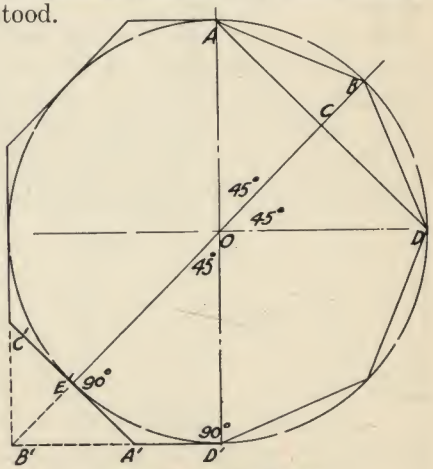
tween alchemy and squaring the circle. Down to now we have never gotten around to either one but this little piece of geometric construction has proved itself fully as useful as any refinement of the ratio 3.1416.

M. W. C., of Tulsa, Oklahoma, suggests this short cut: "Drive two nails the same distance apart as the desired diameter of the circle to be drawn. Then lay the square so that the inside edge of the tongue and the blade will lie against these. Set your pencil in the inside angle of the square, C, and slide the square around, keeping it on the nails all of the time. The result is a perfect semi-circle. Reverse the square for the other side of the circle." Works like the pattern maker's plane.

This is an adaptation of the old geometrical problem that every triangle inscribed in a semi-circle is a right angle triangle.

The Ins and Outs of Octagons

14 There are a great many methods of obtaining the length of one side of an octagon. R. W. L. of Santa Monica, Calif., contributes this one. As the illustration will show, the calculation is based more on right triangles and is one very easily understood.



Inscribed Octagon.
$AD = AO \times 1.4142$. $AC = \frac{1}{2} AD$
Then $AC = OC$. $CB = OB - OC$
and $AB = \sqrt{AC^2 + BC^2}$
Circumscribed Octagon.
$B'O = 1.4142 \times OD'$. $B'E' = B'O - E'C$
$B'E' = E'A'$ and $A'C' = 2E'A'$.

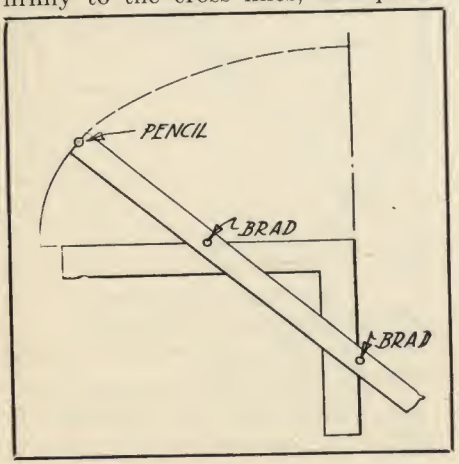
A Sure Ellipsograph

15 The millwright and the builder very often find occasion to lay out an ellipse in sheeting around stacks, exhaust pipes and through pitch roofs. C. E. M. of Harrison, Ark., has discarded all methods for the one he calls his. It eliminates the chance for error through stretching in the cord.

His method is to lay out a rectangle on a sheet, the size of the ellipse, and place the long and short diameters within the rectangle. Then pick up a stick or any piece of scrap strip and measure from the end the distance of one-half the major diameter, make a mark, then measure from the same end the minor diameter and mark.

Drive a small brad through each of these marks, pull them out and put them in from the other side of the strip. Then snip off the points and drive them back so they protrude not quite the thickness of the heel of the square.

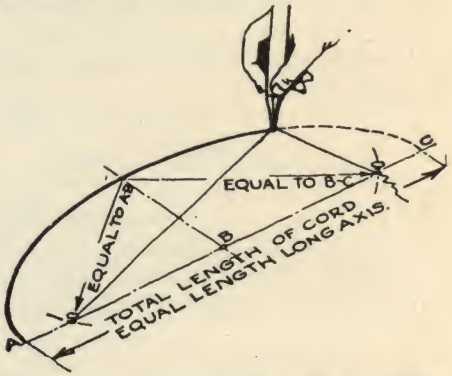
Next put a steel square on the sheet, the corner in the center of the cross and place strip on square so that the heel or angle of the square is between the points of the brads. Hold square firmly to the cross lines, also points of brads firmly against the square, bring the end of the strip as near the square as possible while keeping the brad hooked over the heel and placing a pencil at the end of the stick move the stick through the first 90 degrees, making one-quarter of the ellipse.



Proceed likewise on the other three sections and you have a true ellipse which will always fit if the square is held in place by brads against square.

Constructing Ellipse With Cord

16 Many building mechanics are still having trouble with the ellipse and C. S. M. sends in his method. He claims much experience



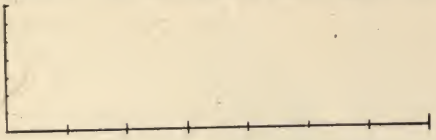
in the use of this figure and vouches for the speed, simplicity and economy of this method. The illustration is self explanatory.

The Ellipse Again

17 The idea shown here has to do with forming an ellipse without the use of a compass, and B. H. W., of Austin, Texas, who sent it, says it is easier than the methods previously shown.

Lay out on a board one-half the length of the span, and the height you

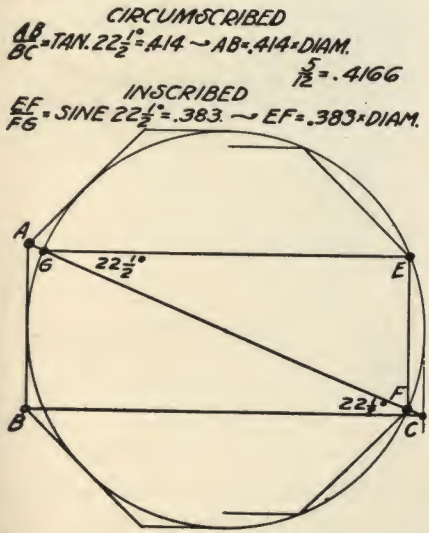
want the ellipse in the center, as shown. Then divide your height into



one inch spaces, and your half-span into as many equal spaces as these one-inch spaces in the height. Draw a line from the center mark to the top one-inch mark, then the second and so on down the line as in the second figure.

In commenting on the discussion on

octagons at different times he observes that he has never seen a rule for obtaining the length of one side of an octagon of any diameter. He offers

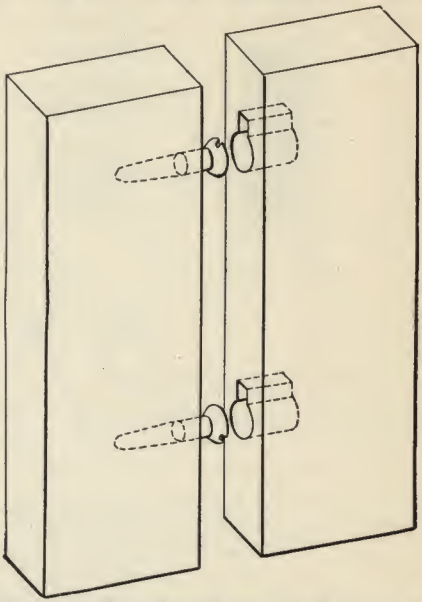


this one. Each side of an octagon is equal to $\frac{5}{12}$ of the diameter of a circle described within the octagon. This may not be accurate enough to work steel but it is close enough to work wood.

A Stunt in Joining

18 Here is a kink for joining boards edge to edge, sent in by W. E. M. This is used for mantel tops, wide seats, shelves, or wherever an extra wide board is required. The edges of the boards should be joined so as to make a good glue joint.

Mark the edges of the boards for the screws from 8 to 16 inches apart as wanted. Turn the screws in the



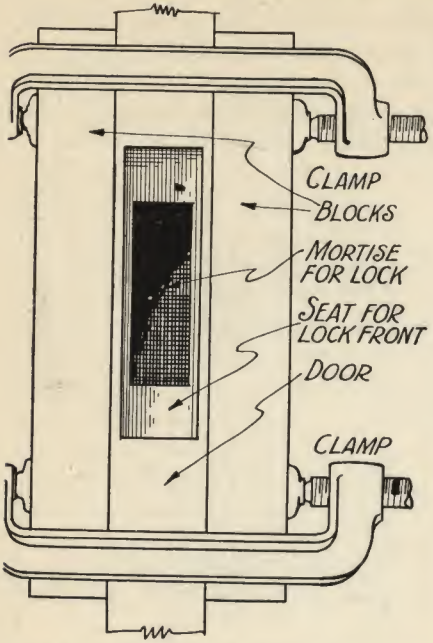
center of the edge of one of the boards leaving the heads to project ¼ or ⅜ inches. Bore holes to receive the heads in the center of the edge of the other board the same size as the screw heads and ⅜ inches deep.

Cut slots alongside the breadth of the screw diameter. The slots must be the same depth as the holes.

Try the boards together to see that they fit and that all of the screws enter the holes, then take apart and glue the edges. Put them together with the bottom piece held in a vise on the work bench. Hold the top piece down tight and drive it endwise.

Don't Scar the Doors

19 Here is a method used by F. G. W., of Ashton, Iowa, in seating a mortise lock, especially in 1⅜ inch hardwood doors, to prevent the side

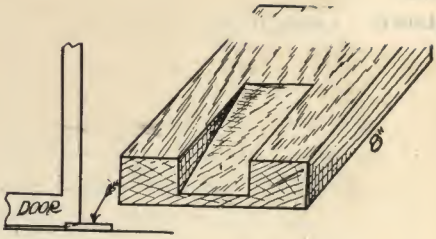


wood from breaking off while chiseling the seat for the mortise lock front. Simply clamp a piece of scrap stuff on each side of the door, flush with the edge and opposite lock seat, and chisel away. The small portion of wood left on both sides of the lock will not split or chip away.

Wedge for Doors

20 When mortising for lock it is important that the door be solidly held. Here is a simple wedge that will answer the purpose and can be made in a jiffy.

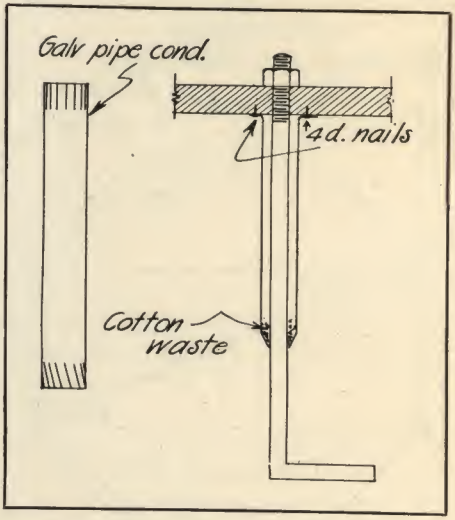
Take a 1 inch board and saw out a piece 8 inches long by 4 or 6 inches wide. In this cut a mortise 1⅜ inches wide as shown in the accompanying



sketch. This wedge is very handy, especially in close quarters, as it holds the door solidly and can be quickly changed.

A Simple Anchor Bolt Sleeve

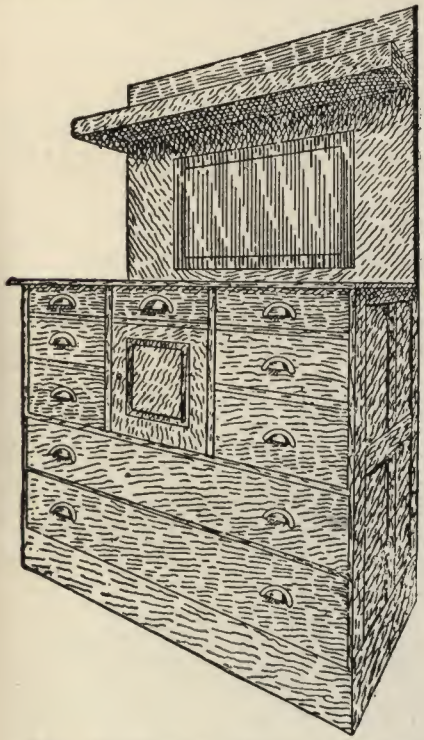
21 A novel sleeve for anchor bolts is submitted by A. R. L., of Laconia, New Hampshire. It is made of galvanized conductor pipe that is twice the diameter of the bolt and



about three-quarters as long. The pipe is cut with a hack-saw slit with snips, and the ends bent over. It is cheaper in material and labor than gas pipe. In actual use it has proven equally as effective as the ordinary device usually employed.

[illegible] China Closet

22 The house where D. L. S. lives is well planned, he says, because he has taken particular pains to make it so. He is also a firm believer in the comfort and convenience afforded by proper built-in furniture.

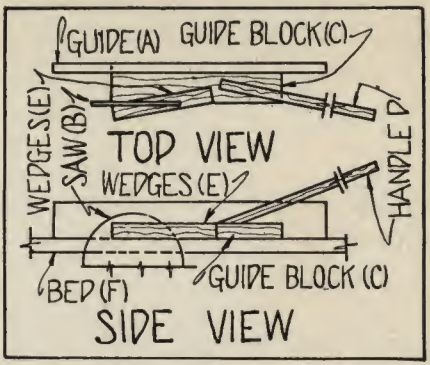


The illustration shows an original and unique idea in china closets, which was really inspired by his wife, although the design is his.

The back of this piece of furniture is cut between the two shelves to form a panel, which is hinged at the bottom. This panel opens to the back and can be let down from the kitchen, so that it forms a shelf just above the kitchen range. Equipment of this sort tends to provide an orderly work room for the housewife as well as supplying much needed space.

Cutting Shoring Wedges

23 In reinforced concrete work it is necessary to use a considerable number of wedges when setting forms, the purpose being to level the



forms by taking up or letting down the wedges. Cutting these wedges by hand is an almost impossible task.

Any power saw will do but a circular saw is best. Inasmuch as the insurance companies report many accidents due to careless handling of circular saws this machine has come to be looked upon as a hazardous sort of affair, but if handled correctly and carefully it is no more dangerous than a concrete mixer.

It consists of a guide block (C) cut from a piece of 2 x 4″, to which is nailed a long handle (D) of 1 x 1″ or 1 x 2″. The handle is set at a diagonal so that the workman need not stand directly over the saw when cutting the wedges. In the side of the block (C) a slanted line is marked and the piece cut out, thus allowing the piece from

which the wedges (E) are cut to be set on a slant as they are fed to the saw.

The method of operation is simple. The guide block (C) is set on the sawbed (F) and a piece of 2 x 2″ or 2 x 4″ (E) depending upon whether the wedges are to be two or four inches wide, is set in the slanting cut. The guide block (C) is then held against the guide (A) and fed to the saw. Inasmuch as the piece from which the wedges are to be cut is set at a slant, it will be cut into two wedges as it is fed to the saw if the slant has been laid out properly.

CHAPTER III

Short Cuts in Field Equipment

GOOD equipment on the job means that the work will go along at the best possible speed. Many labor-saving devices, machines, etc., for builders are now to be had at moderate prices enabling one to build better buildings economically, even though labor charges are high. In this chapter there is a fine collection of time- and labor-saving short cuts that will help save money.

Engineering Methods on Small Construction Work

24 Instead of wheeling or scraping dirt from the rear of a building to the front, this Duluth, Minn., contractor, who had considerable grading to do, used a low, narrow gauge dump car. This is a good instance of how one man kept a piece of equipment working which may otherwise have been standing idle, for its use on small building work is seldom seen.

To Hold a Sidewalk Incline

25 Where material delivery is made at the site instead of at the curb an incline is necessary to bring the trucks over the curb to the sidewalk. The one shown here was used on a job in Portland, Me., by N. E. Redlon.

It is built of three 8 x 10"'s, spiked to a wedge-shaped piece of plank which rests on the pavement. The wedge-shaped pieces of plank are spaced about three feet on centers in order to make the incline solid and to prevent the deflection of the surface planks when a load goes over them.

In order that the truck wheels passing over the incline may not be blocked by the two-inch thickness of plank when the truck starts over the incline, the edge is beveled. This bevel also serves the purpose of prolonging the life of the first plank in the incline since a plank with a vertical edge would soon be crushed by the heavy loads.

Notice that a spike has been driven into the pavement at the edge of the

first plank. This spike will prevent incline from slipping forward and leaving a space between the upper

edge and the curb as an unfastened incline is certain to crawl. If the pavement is asphalt this method can be readily used with but slight damage to the road surface. Note also that a barricade is provided to prevent trucks from running over the ends of the incline.

To Prevent Splitting at Ends of Runway Planks

26 Many builders have sought for some way to prevent the destruction of runway planks due to splitting at the ends but have been unable to find a preventative. The picture shown here is probably the best remedy for the trouble. It may not prevent splitting entirely, but it will hold the planks together after splitting has occurred and will serve to prevent the elongation of the crack and the consequent destruction of the plank.

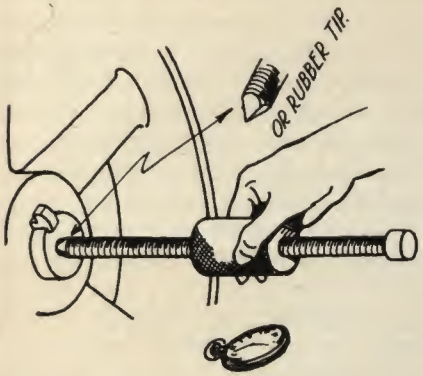
This "kink" is nothing more or less than a two-inch, heavy-gauge sheet metal band nailed at the ends of the plank. It should be bound tightly around the plank so that it acts in a manner similar to the barrel hoop.

The cost of placing these strips is very small. Credit for the idea belongs to the Pfeiffer Construction Company of West Allis.

A Simple Speed Counter

27 Tachometers are not always available but this little instrument submitted by G. A. L. fills the bill for those who want to determine the speed of a shaft. This simple method was recently demonstrated by the owner of a portable sawmill. It is required to get the revolutions per minute of the saw so as to allow for the proper cutting speed.

The owner used a threaded rod with a knurled nut. One end of the rod bore a triangular point and the other



the head. Placing the point in the center hole of the shaft, the nut was held stationary for a period of 15 seconds, more or less, depending on the velocity of the saw and the length of thread on the rod. With ten threads per inch on the stud it was only necessary to measure the advance of the nut in the given time to determine the rate of the shaft.

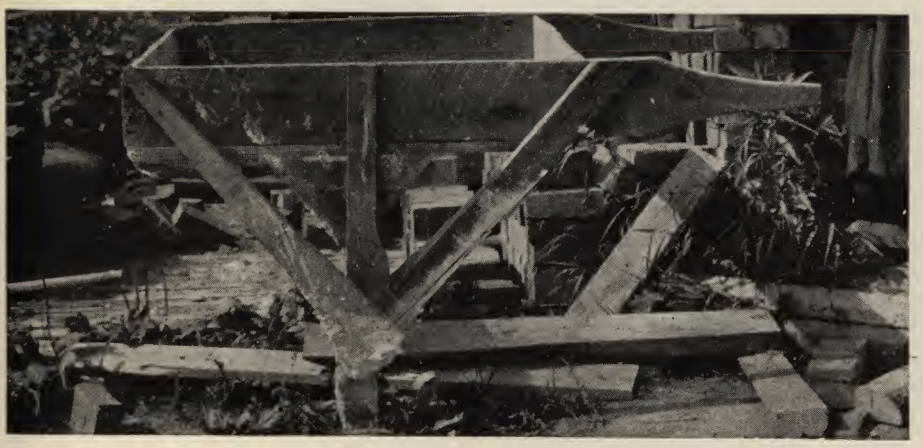
A Tilting Sand Screen

28 Do you screen your own sand on the job? If so, how do you do it? Do you throw the sand up against an inclined screen, as nearly everyone else does, or have you a little idea of your own?

Take a look at this illustration of the way Bert Bissel, a Rutland, Vermont, contractor, does it. He builds a screen box and elevates it on a pair of legs so that it can be tilted. The arrangement is operated by tilting the box back and forth, thus rolling the sand to and fro on the screen. The longer the box, the greater roll will be given the sand. Therefore, the efficiency of the screen will be greater as the length of the box is increased.

But you must bear this in mind. The longer you make the box, the smaller you make the tilting angle, and the smaller you make the tilting angle the less efficient the screening becomes. Of course, the efficiency can be maintained by increasing the height of the leg in the same proportion as the length of the box.

If you want the best possible results from this outfit it is unwise to bring the tilting angle below 45 degrees. This means that the distance, when the screen is horizontal, from the ground to the screen should be the same as the distance from the leg to the end of the box.



A Fixed Hod Rest

29 The illustration shows a hod rest used by A. F. P., of New Haven. This hod rest is not complicated or expensive to make. It is simply a wide board, notched at the top to hold the hod, and fastened to the mortar box.

It is customary to use loaded barrels or tripod lean-tos for hod rests but a board, nailed to the side of the mortar box, will serve the purpose admirably and will make it unnecessary to block the job with the cumbersome hod rests commonly used.

An Elevated Mortar Board

30 One way of getting better efficiency from labor is to provide as many devices as possible to make the work lighter and to conserve the workman's energy. Any method by which a workman's labor may be made easier or more pleasant is bound to pay the contractor in rich returns of increased production.

In this illustration is shown an elevated mortar board used by the Way Building Co. of Madison. Notice that when the mason picks up a trowel of mortar he does not have to stoop to the scaffold level but merely needs to turn around. Thus not only is his energy conserved, since it is not necessary for him to bend, but also the time occupied in bending is saved.

This is, of course, only a fraction of a minute but if one can realize the number of times the workman stoops to pick up mortar it is not difficult to understand that these fractions of minutes mount up in a day to the time required for laying several bricks.

This is one of the many little labor savers that make money for the builder. It also may serve to show how the stopping of a very small loss may result in a considerable saving. Mentally add all these small savings on a single job sometime.

A Well-Built Mortar Box

31 Some contractors consider their mortar boxes in the light of a hit or miss piece of equipment that is thrown together from odds and ends, used for one job, and then scrapped. Not so, however, the William H. Deason Company of Madison. The mortar box they use is shown here and it has many features to recommend it to the builder who considers his mortar box as a piece of equipment rather than a box built of scrap lumber.

The framework of this mortar box consists of 2 x 4″'s. A long piece is used to carry the bottom boards and attached to this long piece is a short stud stiffened by a brace nailed to the bottom piece as shown. The bottom 2 x 4″ is extended far enough past the side of the box to furnish a place upon which the brace can be nailed. The ends of the box are sloped to prevent the mortar from lodging in the corners.

Notice that the end of the box upon which the hoe is resting is sloped more than the opposite end. The purpose of this is to make it easier for the mortar-mixer to draw material out of the box with his hoe or to furnish a place where stiff mortar can be worked.

If it is desired to "knock-down" this box it is only necessary to rip off the boards. The beams that furnish the base upon which the box is built can be transported or stored without breaking them up since they occupy little space.

Getting Power from a Concrete Mixer

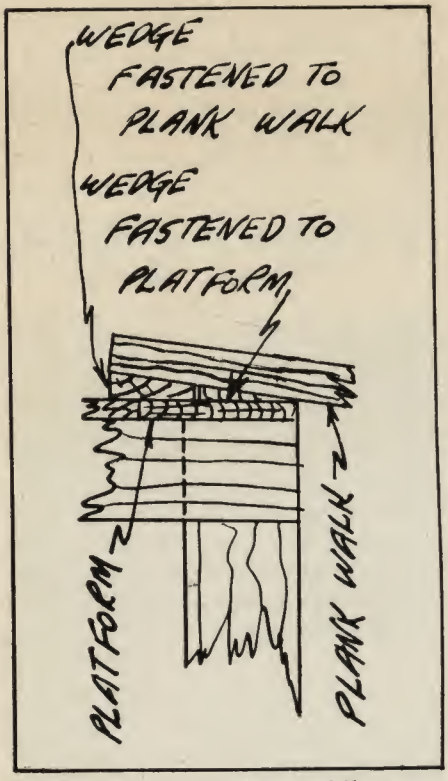
32 Engines on concrete mixers can be used for other things besides turning the mixer drums around. The equipment necessary to get power from the engine is very simple.

The only things necessary are a few U-shaped bolts, threaded at each end, and a wood disc which is fastened to the engine fly wheel with bolts.

It is recommended that the bolts be at least ¼-inch in diameter, as they will be required to transmit from 1⅛ to 3 H. P., which is about the rating of the average small concrete mixer engine. C. D. gets power from his engine for driving a circular saw as well as for running his mixer.

Making Plank Walks Safe

33 An inclined plank walk such as is shown in the photograph is handy on a job. The plank itself if simply placed in position is liable



to slip off the platform while someone is walking on it. Whoever is unfortunate enough to be on the plank at the time it goes down is liable to be hurt.

In order to prevent the plank slipping off the platform L. G., a contractor of Fargo, N. D., has a little kink in connection with this runway shown in the sketch. He nails a shingle at the edge of the platform and a wedge-shaped piece of wood at the end of the plank which rests on the platform.

The plank is therefore held tight and cannot slip. This is much better than nailing the plank to the platform because it can be easily lifted off.

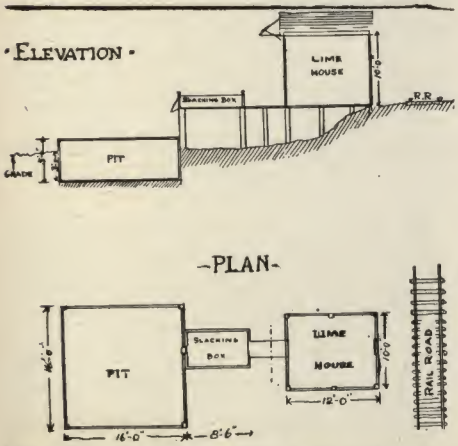
Safeguards such as this, while apparently of a trivial nature, are really forms of insurance against loss of time and money through personal injury and damage suits.

Lime Slaking Plant

34 The line sketch shows the layout of the lime-slaking plant of the Maugans-Bell Co., of Murfreesboro, Tenn. The operation of this plant does away with the slaking of lime on the job and where enough lime is used to warrant the erection of such a plant a considerable saving in labor should result.

The lime is unloaded from the car to the lime house and there stored to be used as needed. From the storage house the lime is put directly into the slaking box and slaked, then placed in the storage pit and delivered on the job as lime putty as it is needed. The stored lime putty is protected from the weather by a few tarpaulins hung on racks above the pit.

The putty can be stored for a considerable time without deterioration and where it is to be used for a finish plaster coat, plastering contractors generally recommend that the putty be seasoned for a short while rather than be placed on the wall immediately after being made.



The business of bringing a lime box and a mortar box to every job, and placing a man on each job to slake the lime is quite an expensive affair, and if the job is small it is sometimes a problem to keep the mortar mixer from standing idle a part of the time.

In these times when the cry among contractors is for efficiency and continuous operation, and now that the disadvantage of high labor turnover has come to be generally understood, every contractor who is alive to modern methods strives to afford steady employment for his men. A slaking plant such as is described here is one means of keeping a couple of men busy when work is slow.

To the contractor who runs only one or two jobs at a time a slaking plant is hardly a profitable investment, as it requires that some money be tied up in the lime-house, slaking box and storage pit and the rental of a site, but for the contractor who has several jobs going at the same time and can keep the plant in operation quite steadily, this idea should be a money-saver.

Dash Spattering Apparatus

35 Lowe Bros., plastering and stucco-work contractors of Wilmington, Del., use simple and very inexpensive equipment for spattering dash aggregate on stucco walls. The aggregate is carried in a screen and thrown on the wall by means of the wooden paddle shown.

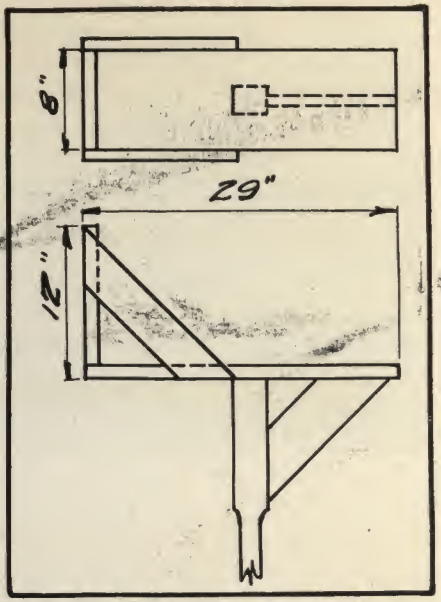
The screen is made of heavy wire so that it does not soon wear out. By the use of the screen, the contractor may be assured that little dust gets on the wall, as it all falls through the screen when the aggregate is scooped up. Dust, by the way, may cause a spotted and dis-

colored wall and all aggregate should be washed before it is thrown on.

The paddle is a simple affair and is cut from a shingle. A few strips are nailed at the edge as shown to prevent the aggregate from slipping off as it is about to be thrown on the wall. The screen may be bought from a local dealer or it may be made on the job.

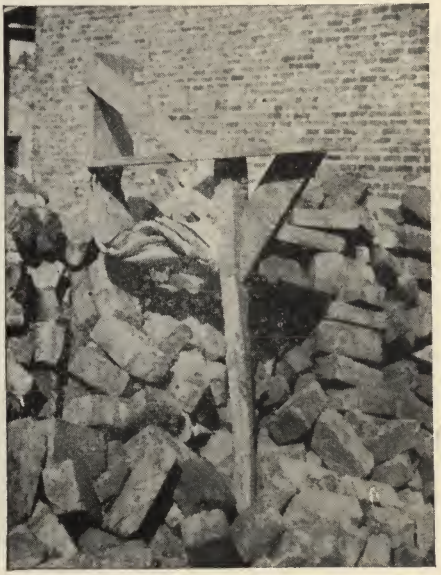
A Home-Made Brick Hod

36 This is a hod built by a contractor especially for carrying bricks. As will be seen from the illustrations the construction is simple.



The hod may be built of a few pieces of scrap picked up around the job and the design is excellent for the purpose intended.

The base of the box and the end piece may be made of 1 x 8″, the diagonals of 1 x 3″ or 1 x 4″ and the handle may be cut from a strong piece



of 2 x 2″. While it may seem possible for the bricks to fall out when the hod is carried, it is quite unlikely that this will happen, as they will be held to the box by their own weight.

A Temporary Blockade

37 The Central Engineering Co., of Davenport, keep a number of blockade horses such as are shown

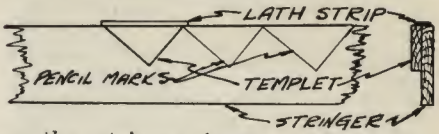
here as a part of their standard construction equipment. These horses are made in three parts: the bar and the two supports. The bar can be slipped out of the supports in a jiffy, thus allowing the horse to be set up in a hurry. The illustrations show the construction in detail.

This piece of equipment should be especially useful to the cement contractor.

Templet for Stair Stringers

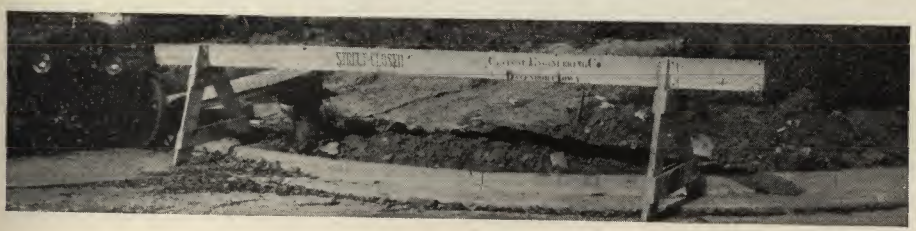
38 W. H. T. contributes this little kink for carpenters' approval. The piece is a templet for cutting stair stringers and it is valuable for all work where exactness is not required.

The templet is cut true so that it will give the required height of riser and width of tread for a particular stair and it is used to lay out the cuts



on the stringer instead of using a square. We all agree that this method is not as accurate as where a square is used, but it saves considerable time. When laying out a stringer for an exterior stair, the little error which may creep in will be hardly enough to give any trouble, whereas the time saved may be considerable.

If you look closely you can see a lath nailed on the diagonal side of the templet. This lath extends beyond the face of the templet and provides a means of guiding it along the stringer. When using this little de-

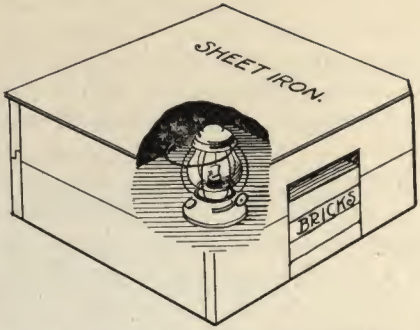


vice all you have to do is set the templet on the stringer, run a pencil around the edge to mark the cut and then slide the templet along the edge of the stringer to mark the next cut.

This may be "old stuff" to you, but if you don't know about it, it may be worth a trial. The use of this templet is the same, except that it is not so precise, as when an adjustable fence is used in connection with a steel square.

Heated Mortar Board

39 A sheet iron topped mortar board warmer is suggested by S. B. The box is the size of a bricklayer's mortar board. The bottom and sides are ship lap, and the top sheet iron. One side has an opening, which is cut the length of a brick, and about four bricks high. These are laid loosely on their flat. A kerosene



lamp is used for a heater. This is successfully used on some jobs during the frosty weather. It prevents freezing, and eliminates waste of time and material.

A Home-Made Hod

40 The hod shown here was made by a laborer in the employ of Frederick New, a builder of East

Orange, N. J. The handle is made from a stout branch, split at the end to receive the box. A short piece of 1 x 2 is nailed on the under side of the box so that the sharp edge will not bear on the carrier's shoulder.

An interesting feature of this hod is the two handles projecting from the open end of the box. These handles provide a place for a grip on the box and are a help to the carrier in lifting the hod to his shoulder and in dumping the load.

The Pitchboard

41 Relative to the use of the pitchboard we are glad to publish this short cut from E. H. N. The writer built stairs and railings in New York State through a period of several years some years ago and it seems to him that the earlier kink of W. H. T.'s is not quite complete.

The templet used is properly called a "pitchboard." It should be made of thin wood, preferably half-inch soft pine. Plane the edges representing rise and run first square through the board and accurately square with each other. Then with the aid of a good steel square, using the inner edges of tongue and blade, mark the lengths of rise and run, respectively, on the pitchboard with a sharp knife.

Plane the hypotenuse edge square and true to these distance marks, setting the plane fine, to make it very accurate. Thus you produce a templet of fine accuracy to a riser height of small fractions.

Next prepare the edge of stringer by jointing off the finish edge straight and true. If it is a wall stringer to be housed out, joint the upper edge; if an open front stringer to be housed out for treads and mitered for the risers, joint the lower edge. In either case gauge a line with a panel gauge

A Use for Lime Barrels

42 What do you do with your old lime barrels? Throw them away, or use them to keep the boiler going under the hoisting engine?

See what M. Marx, a White Plains contractor, does with his lime barrels after they are emptied. He makes mortar kegs from them. Notice that one stave is cut longer than the rest. This long stave serves as a handle.

to the desired width to the lower edge of the pitchboard.

Then ascertain the exact length of the pitchboard by standing it on its hypotenuse and marking its extremities on a board with the point of a knife. Set a pair of dividers to these points and 'step off' as many of these distances on the gauge line as there are treads to lay out. Place the pitchboard flat on the stringer with its hypotenuse resting on the gauge line and its points coinciding with the divider marks. Mark each tread and riser along the edges of pitchboard with a sharp knife, taking care not to cut into the pitchboard.

This is the method used by old stairbuilders for years to lay out finished stringers with accuracy. The knife mark serves as guide to saw either straight or mitered cut or to chisel the edge of housing.

Gauge for Setting Grounds

43 This device, which the writer saw on a job of J. L. Weirs, is what is known as a ground gauge. By its use, the spacing of grounds becomes easy and the carpenter is assured that the edge of his ground is perfectly straight all the way down the stud.

The gauge is made of two long pieces of hard wood held together by two cleats, with the inside edges of the long pieces as true as they can be made. Two small blocks are nailed to the cleats in order that the whole arrangement may be kept far enough away from the stud so that the grounds can be brought to bear against the inside of the long pieces.

When using this gauge it is set against the stud and one ground placed, using the straight edge of the

gauge as a guide. Then the other ground is set by being held against the other edge of the gauge. Thus both grounds are perfectly straight and their outside edges are kept apart at the same distance for the entire length of the jamb.

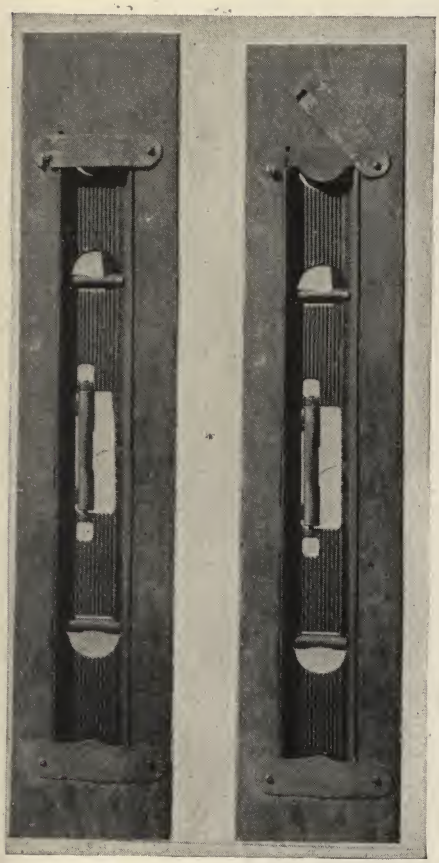
A New Plumb Rule

44 The device shown here is a plumb-rule which is used for plumbing door-jambs. It was made by R. A. Day, a Moberly, Mo., carpenter. This plumb-rule differs from those ordinarily met with in that it is built to receive a small level. When the rule is not in use the level can be removed and used for other work.

A study of the illustration showing

the section of the rule at which the level is attached will show some interesting features of this instrument.

An opening is cut in the rule at the middle to receive the level and is made the same shape as the outline of the instrument. This opening must be cut exactly true to the outline of the level so that when the level is in place there will be no play.



A tight fit is essential to the accuracy of the whole arrangement.

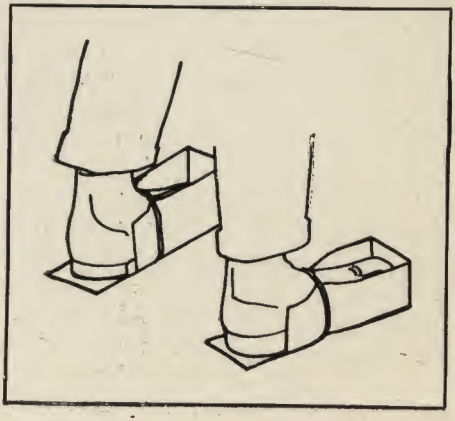
Two clips, screwed fast, hold the level at one end, but at the other end only one slip is screwed fast, while the other is fixed so that it can be swung free of the level, as shown in the photograph.

This plumb rule has an advantage over the one ordinarily used since the arrangement of level tubes permit plumbing with either end of the rule on the floor. The ordinary plumb rule is generally built with only two level tubes, one vertical and one horizontal, and if the carpenter takes hold of the wrong end first, he must tip the rule end for end before he can use it.

Handy Slippers

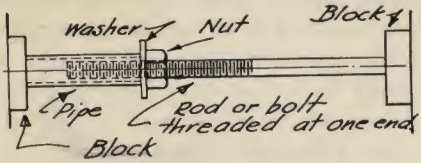
45 From L. L. M., of Seattle, comes this short cut. When placing hardware after floors are finished a carpenter must wear soft slippers, remove his shoes or take some precaution against injuring the floor. This is something of a bother. L. L. M. finds that the cover of a lock carton (of which there is always a good supply on hand) serves the purpose.

Take the cover, break one end down, and place it over the shoe with the loose end under the heel. Clamp it on with a rubber band or a short section of inner-tube. This is economical, easy to apply, and does as well as anything else. Another case of good use for old tires. They are even making rag rugs from casing fabrics.



A Spreading Jack

46 The illustration shows a spreading jack submitted by R. E. J. of Philadelphia. He recommends this as a kink which is very useful when it is necessary to spread



something that does not yield to ordinary methods. A wrench operated on the nut gives a very powerful purchase. The length and size of the material can be varied to suit, and can be found around most any job.

A Convenient Nail Tray

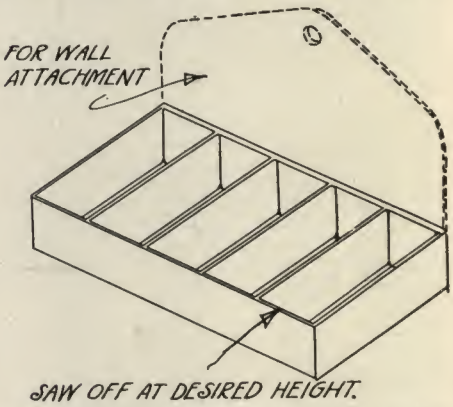
47 D. A. H. sends in the following. One of the most convenient accessories that the woodworker at the bench can have is a container for small nails and screws. These things he often makes himself, of wood, or he buys those household baking tins that have about a dozen pockets in them or he may get hold of one of those metal trays that shoe repairers use to keep their various sized nails in, ready to the hand.

But one of the neatest trays is that shown here, which is obtained at the battery shop around the corner. The insides of automobile storage batteries go bad in a couple of years, when the owner has to buy a new one, receiving from the battery man an 'allowance' of about $2 for the old one, which allowance is merely a way of expressing the discount. For the battery man scraps the old battery.

Inside the wooden box there are the rubber 'jars' of the battery and these jars are filled with plates and electrolyte. It is the plates that go bad—the rubber jars, or boxes, are usually in first class shape, but the battery man has so many and uses so few in repairs that he seldom values them, so he is willing to give them away or sell them for 10 cents a piece.

There are about five partitions molded in the jar and if the latter is sawed off about an inch and a half up from the bottom, a case is made that has five spaces of about six square inches surface area in each.

A number of these can be supplied when the work calls for a wider

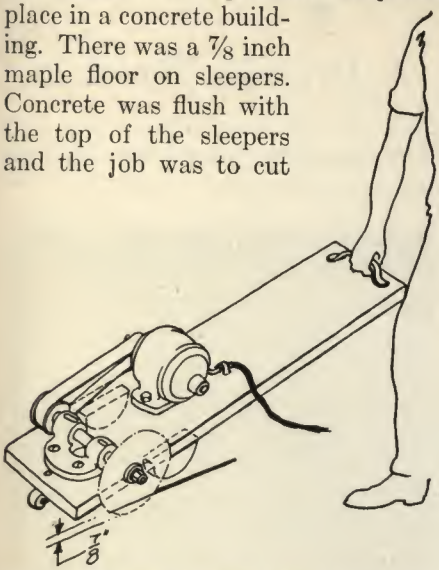


variety of nails, brads, screws, etc. One very nice thing about these trays is their freedom from sliver or catchy joints—there are none because the partitions are molded in one piece and the inside edges are slightly rounded. Another advantage is the non-rusting quality of the material.

A variation of this takes the form of the wall tray shown. All or a portion of one side is left as a back to the unit and a hole is bored through this to hang on a nail. When desired, the material can be worked into somewhat different shape by heating and bending it while warm. In this manner the builder can work out his own idea.

Handy Floor Cutter

48 One way out is shown in the illustration submitted by H. S. B. of Philadelphia. He had about 500 linear feet of partition to put in place in a concrete building. There was a ⅞ inch maple floor on sleepers. Concrete was flush with the top of the sleepers and the job was to cut



out the floor so as to place the plaster blocks.

He took a board 12 inches wide, about 3 feet long and ⅜ inch thick, put a saw mandrel close to one end and a ¼ H. P. motor at the other. Then an 8-inch saw on the mandrel outside the edge of the board and connected it with a belt to motor. He made two curved blocks and placed under the board and behind the saw. Finally, placed a small caster under the board ahead of the saw in such a position that the cut would be just ⅞ inch. This saved a great deal of time.

An Inexpensive Tamper

49 F. C. I. made his own tamper, as shown in the accompanying photograph. It was nothing but a short piece of scrap 6 x 6″ with two

pieces of 1 x 4″ nailed on the sides for handles. There are many types of home-made tampers, but the writer believes this to be as simple as any he has ever seen. The cost of such a tamper is practically nothing.

Handy Expansion Bolt

50 In fastening foreign bodies to concrete walls or piers after the concrete has hardened and no previous provisions were made for same, H. N. drills a hole in the concrete 4 to 6 inches deep. The hole should be 1/16 inch larger than the stud to be used.

Thread the stud on both ends. Cut a slot with a hack saw about 3 inches deep in one end of the bolt, make a wedge tapered from 1/16-inch to ¼-inch; width and length should be the size of the slot in the stud.

Next, insert the sharp end of the wedge in the slot in the stud and insert the stud with the slotted end in the hole in the concrete and drive it in tight, using a piece of oak for a follower block to avoid damaging the thread on the end of the stud that projects out from the piece.

As the stud is being driven into the concrete the wedge is being driven into the slot in the stud, causing it to spread and the threads will grip the concrete, making it impossible to pull the stud out.

A Well Built Door Jack

51 To do a good job of planing a door to fit a jamb, some means of holding the door fast is necessary while the edge is being planed. Most carpenters use a piece of 2 x 6 with a V cut in the end and support the door with one hand while they operate the plane with the other.

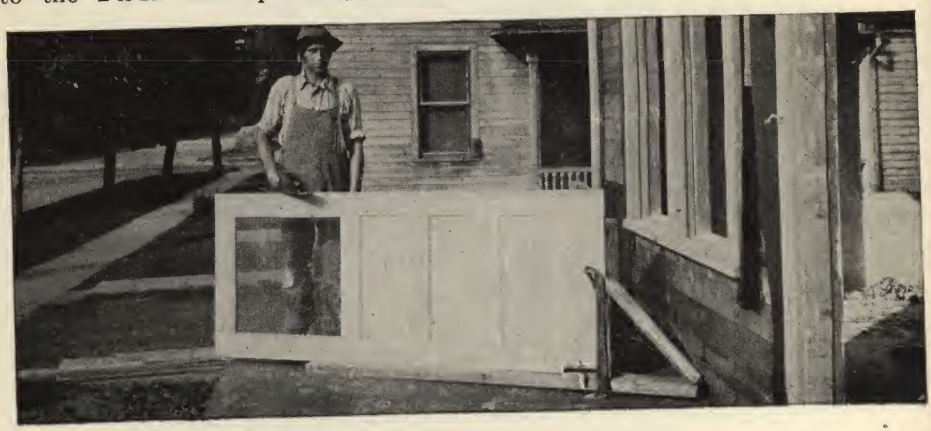
P. E. Scherwin, a builder of Neenah, has his own idea of how to do this kind of work. He uses the outfit shown in the illustration here. It is made of a long piece of 2 x 12, a short piece of 2 x 6, two short lengths of 1 x 4, and a couple of cleats. The 2 x 6 is nailed to the 2 x 12 at an angle, as shown, and is supported by a 1 x 4 strut on each side. It is notched at the top and in the shape of a V to receive the door.

The door is held fast at the lower edge by the cleats which are nailed to the 2 x 12 and spaced just far enough apart to permit the door to slide between them.

The 2 x 12 is used instead of a narrower piece because it provides a firm base and would be less inclined to wabble than a 2 x 10, a 2 x 8, or a narrower piece.

A Drinking Fountain

52 On big construction jobs it is generally profitable for the contractor to employ a water boy. On small jobs, however, this is not profitable but nevertheless workmen must be supplied with drinking water.



C. J. D. solved the problem in this way. He brings a water line inside the building from the mason's water supply and attaches to it a small piece of pipe about five or six inches long, set vertically at a shut-off valve as shown.

The cost of bringing this line into a building is small and it may be the result of saving quite a bit of money which would be lost by the workmen going off the job to a water supply which may be located several hundred feet distant from the building.

A Use for Old Doors

53 Vernhoff and Richmond, contractors of New Haven, Conn., make use of old doors as shown below. Of course, these old doors do not make a very good-looking contractor's shanty, but they do save labor and materials, as a shanty put together of a few old doors requires very little labor and only a few boards for the roof. To the builder who has such material as this lying around in his yard the idea may be a good one. And its use is by no means limited to one job.

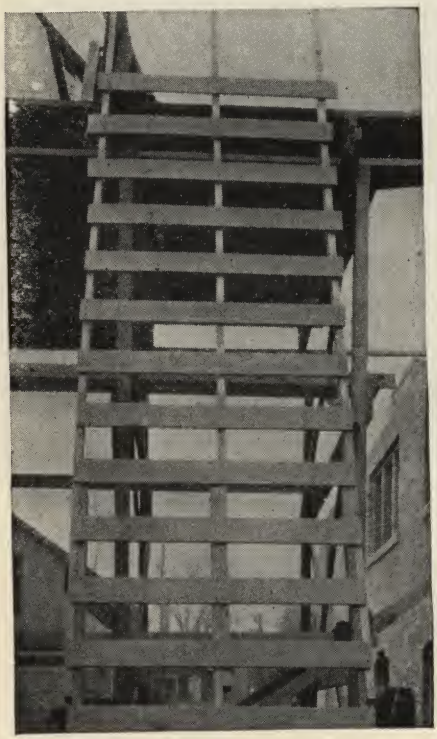
CHAPTER IV

Short Cuts in Scaffolding

SAFETY First should be the motto of every construction job but there is no need to carry this to extremes. What one wants is absolute safety with comfort for men at the least cost. When a man's thought is constantly centered on his own safety, rapid work is impossible. Here are over 30 good hints on erecting safe scaffolding. Every hint or short cut is worth serious study. The hanging scaffold described here may be just the thing with which to do that "difficult-to-get-at" job. There are lots of good ideas in this chapter.

A Time-Saving Ladder

54 Ladders, as ordinarily built on the job, are made wide enough to accommodate only one man. If a bricklayer wants to go up and a carpenter wants to go down at the same time, someone must wait, or else meet about halfway between the two ends of the ladder.



When two men meet half-way between the ends of a ladder, something is going to happen, and no contractor wants any more arguments between mechanics on his job than are necessary.

If one of the men is accommodating enough to wait until the other one has come up or down, it means that someone has lost a minute or two, standing at the ladder. A minute or two may not sound like much, but by counting up all these little minutes that are wasted in one day the contractor will see that they soon run into money. R. L. Reisinger, of South Bend, Indiana, has come around to building double ladders, such as are shown here. It would seem to be a good idea and well worth passing out to brother contractors.

A Laborer's Ladder

55 Where hoists are not used on a job all materials must be transferred from story to story by hod carriers. Most contractors use a slanting ladder, but this kind of ladder has a serious drawback in that the

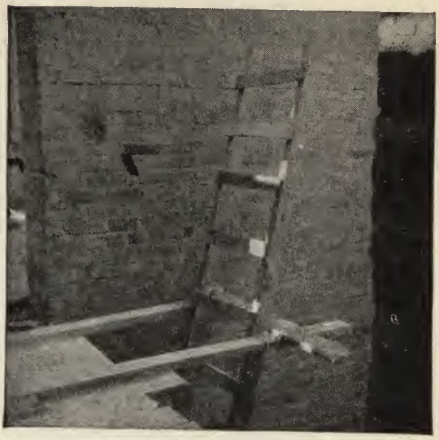
hod carrier coming down is quite apt to bump the bottom of his hod handle against the ladder cleat, and in a short time the ladder must be repaired.

The ladder is fixed in place as shown in the illustration. A strip is nailed to each leg of the ladder and also to three joists. This gives a firm and solid support. At the base, the let is toe-nailed to the rough floor.

Holding a Ladder

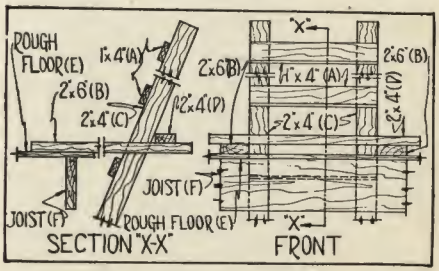
56 It is surprising, to say the least, the common lack of attention given to the erection of builders' ladders. These things are an important piece of equipment on every job; yet their importance is too often underestimated with the result that accidents occur which might have otherwise been prevented.

There are any number of conditions



where different types of ladders and different manners of supporting them may be encountered, but a safe way out can generally be found for each one of them provided a little amount of gray matter is put to work. Watch your ladders. An improperly built ladder or one improperly placed is a menace to the safety of your men and may result in a serious accident.

The illustration and sketch shown here indicate how one builder took care of a difficult situation when called upon to furnish a ladder between two floors in an open stair well. There was



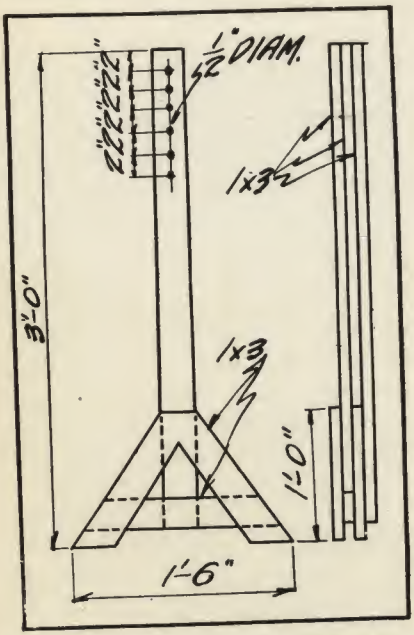
no chance of leaning the top of the ladder against anything and no possibility of setting it between the two side walls without building a plat-

form, hence the following method was devised.

The ladder was erected and held in a collar as shown in the accompanying photograph. This collar consisted of two 2 x 6"'s (B) fastened to the rough floor (E) and allowed to project beyond the edge. At the ends of the 2 x 6"'s a 2 x 4" (D) was nailed, and the ladder allowed to rest against it. It is important that some of the nails in the 2 x 6" go into the joist (F) so that there is no possibility of the rough flooring (E) breaking loose and allowing the ladder to drop.

A Ladder Scaffold Bracket

57 J. C. Hasson, a Moline, Ill. contractor, has designed a scaffold bracket for ladders which may be useful to some other contractors. This



bracket and the manner in which it is used is fully shown in the accompanying photographs and sketch. It is best constructed of hard wood.

The function of this type of bracket is to make it possible to use ordinary painter's ladders as supports for scaffold plank thus doing away with the necessity of building scaffolds when ladders are available.

When in use, the bracket and ladder form a triangle as shown in the illustration in the right hand column. The bracket is made in two parts: the

strut, and the horizontal piece upon which the plank rests. The strut is built-up as shown in the sketch, the base being slotted so that it cannot slip off the ladder rung.

The horizontal member has a steel collar at one end which fits over the strut, and a hooked arrangement at the other end which clasps the rungs as shown in the illustration. In order to keep the horizontal member truly horizontal, the strut is bored for holes as shown in the sketch, and a bolt slipped through one of the holes to

keep the steel collar of the horizontal piece from slipping down the strut. Changing the location of the bolt will change the angle of the horizontal member of the bracket.

A Portable Platform

58 Almost every builder, sometime or other, has wished for a "sky hook" where he could hang a scaffold for a man to reach some place which was not easily accessible. "Sky hooks" would be great things, but since they belong in the same class with winged horses and self-replenishing pocketbooks, the best thing we can do is try to buckle down to work and build something to take their place instead of dreaming what we could do with them if they existed.

C. A. Golden, a contractor of Manchester, doesn't spend much time thinking about "sky hooks," but he does put in a few moments in digging up ideas like the one shown here. This is a little portable working platform which may come in quite handy on your own job. In this case it was used to provide a place for the steel

Variable Height Scaffold Horse

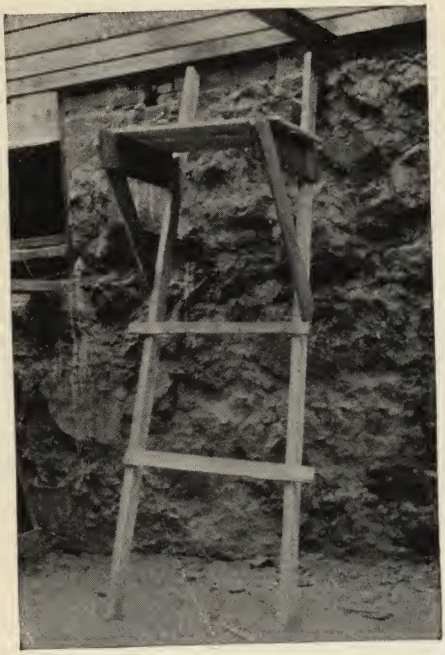
59 You may be interested to know about this little idea which Frederick C. Ives of Rutland uses. It is a means of providing a scaffold which may be varied in height without the necessity of using different sized horses.

The horses shown in the accompanying illustration are slightly over six feet high and the distance from the top of each cross-piece to the top of the next crosspiece is about 16 inches. By sliding planks between the horses and resting them on the different cross-pieces the height of the scaffold can be varied from 16 inches above the ground to over 6 feet.

Notice that the cross-pieces are nailed on only one side of the horse.

worker to stand upon while setting a steel beam.

It was not possible to work outside the wall since a building came directly to the lot line. This platform would seem to be much more satisfactory



than a ladder, as it provides a workman with a greater degree of freedom.

It also gives a man a sense of security he might not otherwise feel when working on a plank or a ladder. This is a factor not to be overlooked.

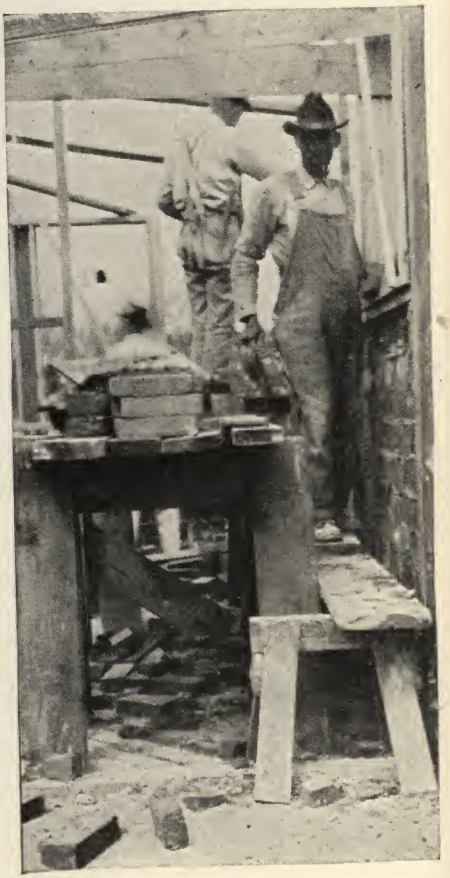
A New Bricklayers' Scaffold

60 To facilitate bricklaying, Anderson and McDonald, contractors of Shreveport, La., make it easy for the bricklayer by providing him with a small scaffold in addition to the usual tall mason's horses. This low scaffold is set as shown in the illustration, and the mason stands upon it so that it is not necessary for him to bend his back every time he wishes to pick up a brick.

When the wall height is such that the small scaffold no longer suffices, it is removed and the larger one is drawn up to the wall. Then another scaffold, higher than the large one shown, is set in place and the work proceeds as before.

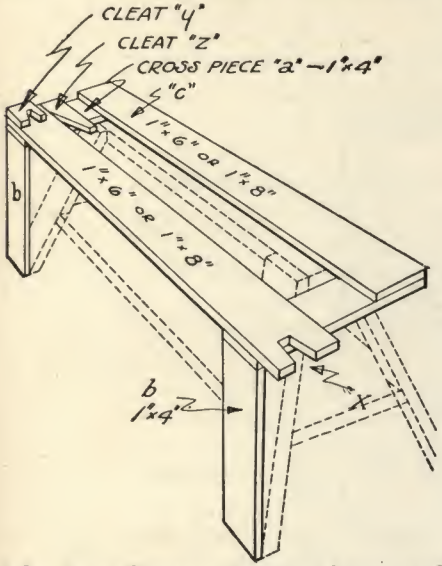
This second scaffold is made high enough so that by working on it the bricklayer can carry the wall one-story high.

The slight investment in the extra scaffolding and the small labor cost required to place it is considerably overbalanced by the added efficiency of the bricklayer.



A Combination Bench and Horse

61 L. L. M., of Seattle, submits another handy combination, a combination bench and horse, that carpenters in his locality use considerably. In sketch you will see that they



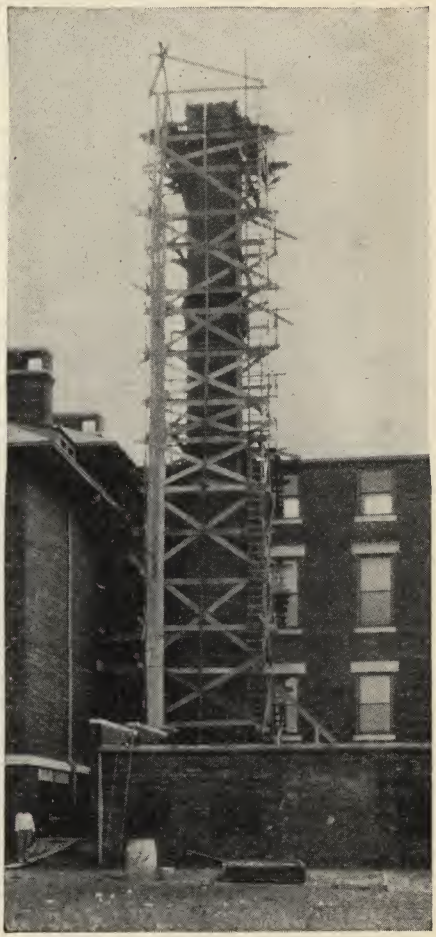
take an ordinary carpenter horse and nail on two cleats, (a, a), of 1 x 4-inch or 1 x 6-inch, then add legs, (b, b); nail boards, (c, c), on top; cut notch, (x), and add cleats, (y and z); and bench is ready for use.

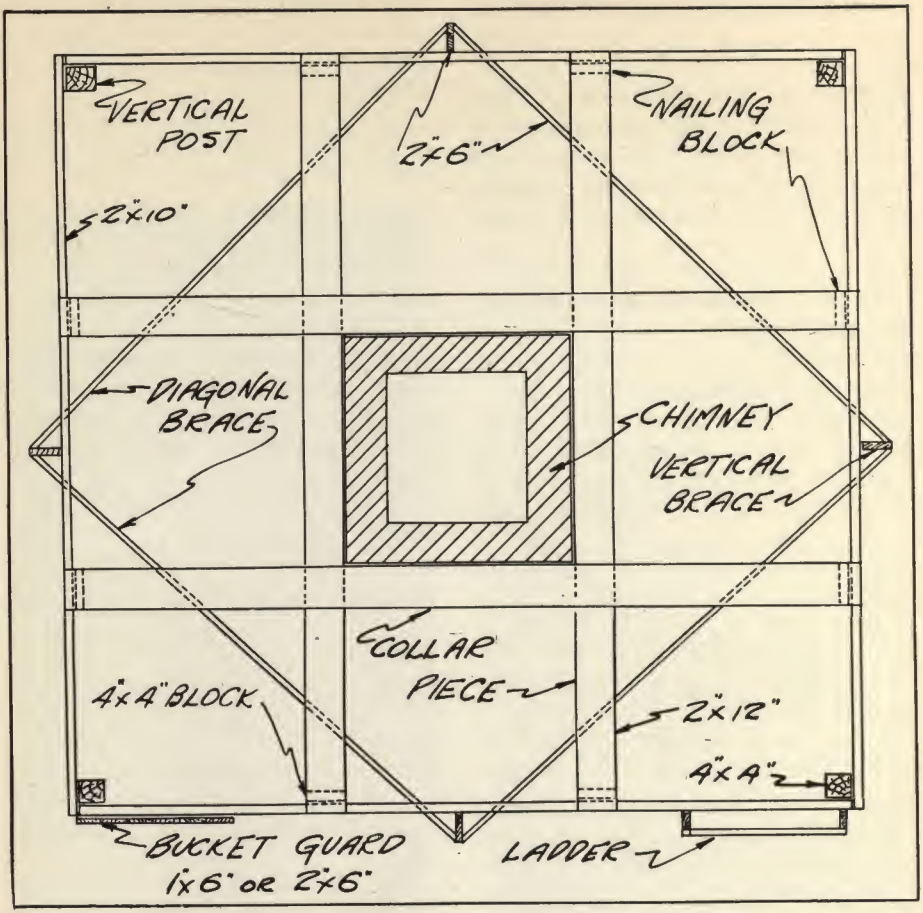
It is especially handy for fitting sash and doors, being large enough on top to hold most any of them without the aid of another horse. When planing down use notch (x) for large sash and doors, and cleat (z) for smaller ones, letting them rest on the tool tray, bringing them within reach.

Chimney Scaffolding

62 The chimney scaffold illustrated here used by W. M. Allen & Son Company, of Peoria, utilizes the partly built chimney as a base for carrying a collar which furnishes stability to the scaffolding. A study of the sketch will show the assembly details.

The collar is formed by four pieces of 2 x 12, one piece being set on each side of the chimney as shown in the sketch. In order to hold the outside framework to the chimney the 2 x 12 collar pieces are nailed to the horizontal members of the outside framework, with 2 x 4 or 4 x 4 nailing blocks to provide a good connection. The whole arrangement is stiffened by means of diagonal bracing which runs between auxiliary vertical members





toe-nailed to the outside framework.

Notice on one side of the scaffold a ladder, and on the other, a bucket guard. This guard prevents the material bucket from damaging the scaffold as it is being hoisted to the top.

An Outrigger Scaffold

63 For certain conditions some contractors use scaffolds of the "outrigger" type. This kind of scaffold is supported by beams of wood or steel projecting out from a building and by its use it is not necessary to build a scaffold up from the ground level.

An outrigger scaffold is simple in construction and may be easily erected and dismantled. With the exception of the outriggers and the horses, this type of scaffold requires only short pieces of scrap lumber, such as are found on any job. This means a saving in material costs.

As regards the labor cost; it may be possible that less carpenter time is required to build an outrigger scaffold than a scaffold supported from the ground since in the outrigger scaffold nearly all the lumber to be handled is in short lengths and, for the greater part of the time, the carpenter is working on a solid floor instead of a shaky system of staging.

Support for the scaffold shown here is furnished by a 2 x 12 projecting out from the wall at the window frame. The outrigger bears on a block which is nailed to the frame and one or two heavy nails are used to hold the 2 x 12 against the frame.

At the end inside the building the outrigger is held by three vertical legs, which are fastened to a 2 x 4 block nailed fast to the rough floor. In order to lessen the liability of swaying, the outrigger is braced with two diagonal legs, as shown in the photograph and in the sketch.

Notice that the base planks which furnish support for the horses, the horses themselves, and the scaffold planks, are all held together with nails. These nails should be driven only part way so that they can be easily pulled.

This kind of scaffold has several noteworthy features which are worthy of recognition. Since it requires no support from below, a good deal of expensive staging, labor and material may be saved by its use. Another advantage of this arrangement is the fact that an outrigger scaffold is entirely independent of scaffolding at any other level but the one.

Where scaffolding is carried up from the ground it is necessary to leave all the timber work in place until all work which must be done outside the building is completed. With the type of scaffold shown here, however, the scaffolding at any level may be removed as soon as the work on that part of the building is completed. Thus it is not necessary to block the lower level with an intricate system of wood columns and braces until the entire building is finished.

Max Marx, a New York City contractor, was erecting this building in White Plains, N. Y., where this photograph was taken.

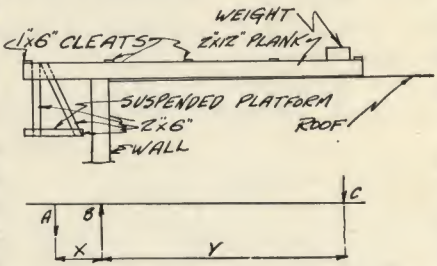
Sheet Metal Workers' Scaffold

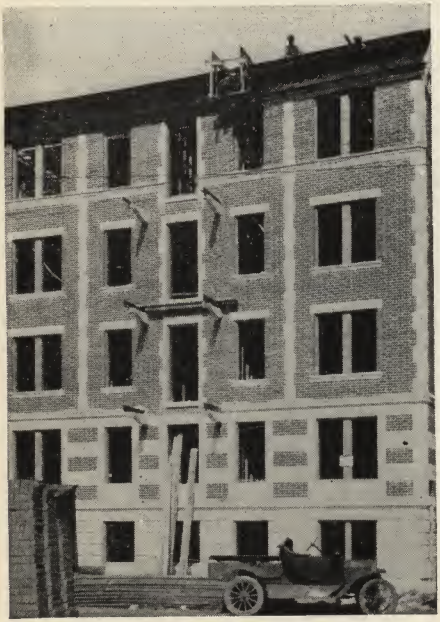
64 Take a look at these fellows hanging over the edge of a four-story building. How would you like their job? You wouldn't perhaps, but someone must do it and these boys are elected.

Even if you don't envy them their job, you may be interested to know

what kind of a scaffold they use to work upon. It is simply two planks on edge with a hanging seat suspended from one end and a small weight to balance it on the other end.

The planks are 2 x 12 and are about 20 feet long, and the small pieces used to suspend the platform are 2 x 6. A few 1 x 6 cleats are nailed across the planks to keep them upright and prevent them from spreading. The arrangement does not at first look like one we would like to tie our hopes to but actually it is safe. The fact that all weight is thrown downward eliminates the necessity of tying in brackets save by weighting them. The chief danger lies in someone's kicking loose or removing the weights. Workmen on the roof must guard against this.



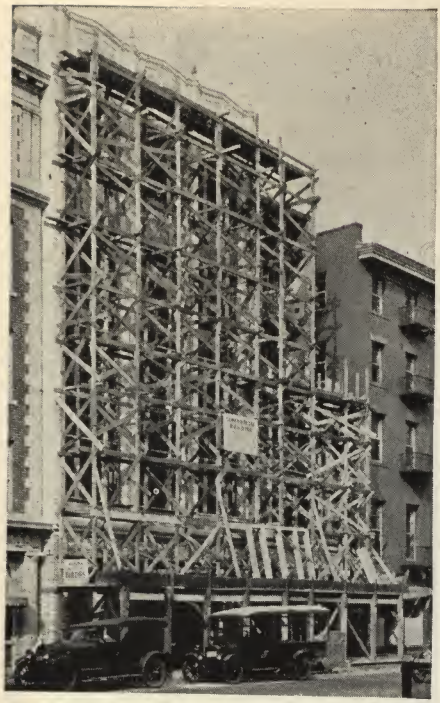


Tall Scaffolding Details

65 For the contractor who is interested in building a scaffold such as is shown here, a study of the accompanying illustrations should show how a tall scaffold is built. The base is built on heavy timber columns and with heavy joists so that the top of the base which forms the roof over the sidewalk may be used as storage space for materials.

The scaffold is built up from this base as shown first, and is held to the building by diagonal braces as shown second. Note that the entire scaffold system is a series of squares, braced diagonally for purposes of stiffness.

For the contractor who is working

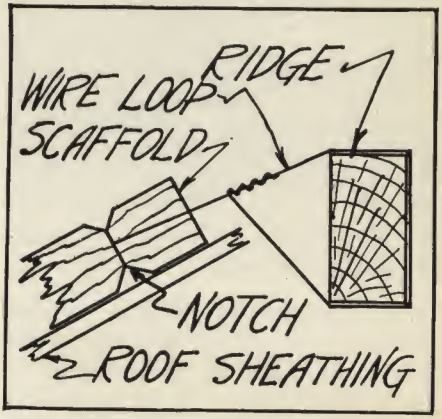


in narrow quarters the storage space provided by the lower part of the scaffold is nothing short of a life saver.

A Roofer's Scaffold

66 In the illustration below is shown detail of roofer's scaffold used by George Beaudette, of El Paso, Texas. When in place it forms a safe and easy place upon which to work. This kind of scaffold has several horizontal members giving the workman a sense of security that he might not otherwise have and thus allows him to work without fear of accident.

The arrangement is held with wire, as shown in the sketch, wound around notches in the scaffold piece and wrapped around the ridge to hold the scaffold in place. If it is desired, rope



may be used instead of wire but it would seem that wire is the safest thing to use since rope may be accidentally cut by a blow from a hatchet or a falling object.

Scaffolding for a Narrow Street

67 Here is how J. J. Robert, a Worcester, Mass., contractor, solved the problem of erecting scaffolding in a narrow street. Instead of building his posts upright from the ground, he slanted them out into the

street, thus getting sufficient working space where it was needed and at the same time allowing for passage of traffic on the street. This simple idea was the way out of a difficult problem and a very effective one too.

Platform for Steel Workers

68 Here is shown a small platform built to assist the steel worker in bringing the next girder to a bearing on the column to which it is attached. It is built from odds and ends.

CHAPTER V

Short Cuts in Handling Material

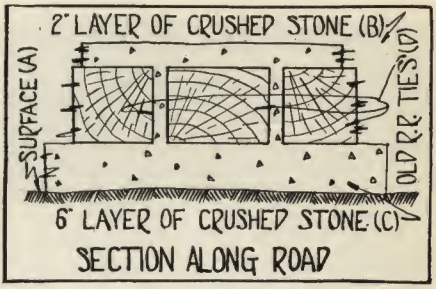
THE loss due to careless handling of building material on the job is appalling. There are right and wrong methods of taking care of materials. One might just as well take a handful of dollar bills and throw them in the air as to carelessly dump materials anywhere on the lot. Building materials represent money and should be carefully handled. The way they are carried, placed and piled up means either that they will be in good condition or in bad. Here are some 20 good ideas that show better ways of handling materials. Take care of material and it will return you a handsome profit.

A Hauling Problem

69 Few contractors have been so fortunate as to always have a good road over which to transport their materials. Quite the contrary, for good roads are generally only to be found in communities which are already built-up.

Many a contractor building in the suburbs has had the experience of having his trucks mired in the mud and has had to go to the expense of hiring teams to have them pulled out. Not only is the added expense of a lead team a burden, but also the interruption to the work may be quite serious.

Here is shown how one contractor solved the problem of delivering materials to the job where the road was impassable. He was building several bungalows in a section where the paving was not yet installed and therefore had to move all of his materials through the mud. He soon found that his job would run into a loss unless he could get his materials on the ground without having to split the loads. After giving the matter considerable thought he worked out the idea shown here.



He first set a few laborers to work leveling off a roadway and then hauled in and dumped several loads of large size crushed stone containing large pieces of foundation rubble. Then some old railroad ties were laid over the stone and a two-inch layer of fine crushed stone spread with uniformity

over the ties. This made a very satisfactory roadway and was built at a low cost. It is important that coarse stone be used for the bottom layer (C) as fine stone would be too apt to mix with the mud and soon sink out of sight.

Material Elevator for Apartment Building

70 One of the main points in connection with the delivery of materials to workmen on the job, is the distance they have to be hauled.

Long hauls for wheelbarrows mean expense for the contractor, and anywhere the contractor can cut down the distance the laborers have to push the buggies is going to mean a saving of money.

In Mount Vernon, a contractor who is putting up a big apartment building, used the delivery supply system shown here. A central hoisting tower was built midway between two wings of the building and all material for all floors was delivered by means of this tower.

Platforms running to both wings at each floor provided for the delivery of material from the elevator to any part of the building. Thus the length of haul was reduced since all materials were delivered to the different floors from a point near the center of the building.

In order to keep the delivery platforms open, the walls around them were not built up, but were left broken out, and were to be finished when the elevator platforms were no longer needed. Notice on the top floor how the roof joists are shored up to hold them over the delivery platform where the wall has not been built.

The shoring for supporting the joists is a line of ordinary 2 x 4″ studding with the center studs spread apart at

the bottom wide enough for a man to bring a wheelbarrow through.

It may be a little more expensive to build up the wall after the work is done, and it may cost a little more money for the shoring required to hold up the roof joists, but these little items are hardly to be considered when weighed against the great saving in cost of labor.

Rack for Steel Reinforcing

71 Where working space is at a premium some economical storage method must be devised. The one shown here, may help out a brother builder who is forced to work in a place where storage space is not plentiful. Heavy racks, built of 4 x 6″ as shown in the illustration, were used.

At intervals of about two feet holes were bored in the rack and one inch rods stuck in the holes for pegs upon which the rods could be placed.

Notice that the diagonal legs of the racks are fastened at the top with a collar, and that they are prevented from spreading by heavy 2 x 10″ ties fastened at the bottom. It should not be attempted to build this rack of light members, as the weight it is called upon to carry is a big one.

It should not, however, be so heavy that it will be difficult to move around. The size of the members depends, of course, on the amount of rods the rack will be called upon to hold, and the height to which it is to be built.

As regards the means of holding the members of the rack together, it is recommended that bolts be used instead of spikes. Spikes are liable to work loose but bolts may be depended upon to hold the rack together if they are drawn up tightly.

Emergency Protection

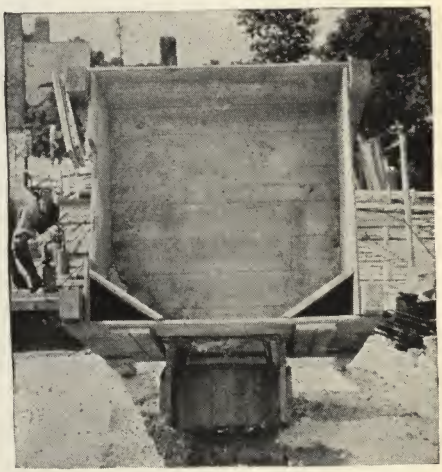
72 You have seen the time, have you not, when the rain came on just as a load of cement was delivered and you had no place to store it? You didn't let it get wet, of course, for cement costs money. You hustled around somehow, and dug up some kind of protection to keep that cement dry.

Here is what Meagher and Callahan, of Hartford, Conn., did under a similar circumstance. The only protection they could find for several barrels of lime was a tarpaulin and a few planks, and it was up to them to do the best they could with the materials at hand. Some difficulty was encountered in holding the tarpaulin in place, but the illustration shows a method that worked very nicely. The picture tells the story.

Concrete Storage Hopper

73 Illustrated here is a concrete storage hopper used on the construction of a small reinforced concrete hospital. Concrete was carried to the forms by means of chutes, but in some places it was found to be inconvenient to pour directly from the chutes into the forms and buggies had to be used. In order to receive the concrete from the chute, the hopper shown here was built.

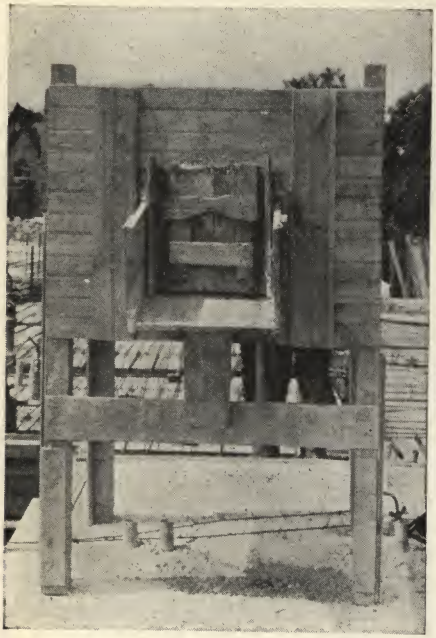
It is mounted on 4 x 4″ legs which run up through the hopper on the outside and furnish a place upon which the boards which form the sides can be nailed. As shown, the bottom is built sloping toward the outlet so that the concrete will more readily pour into the buggies. Note that the corners in the front of the hopper are blocked with boards. This is to prevent the concrete from jamming in the corners and clogging the outlet.



The concrete is delivered to the buggies through a small chute, supported from the leg-brace as shown. Note also the hopper door and the

manner in which it is built and held to the box. It slides upward and can be jammed down in position when it is desired to cut off the flow of concrete.

This whole device is simply and easily built. It is small and portable and a good thing for the man whose job does not warrant the purchase of

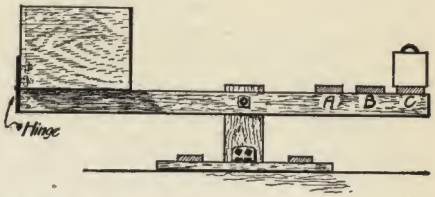


a regular steel hopper. Such a hopper as this should last through an ordinary sized job.

Even Mortar Mixture

74 Sometimes a whole job is spoiled by the fact that the mortar between the bricks is of different shade. Here is a little idea which works out nicely and insures an even mortar.

It consists of a box hinged to two 2 x 4's about 6 feet long with a platform on the other end for balance weights and a hole exactly in the center of the 2 x 4″ and a rod. Care should be taken when placing the balance weights on the platform, as a 100-lb. will mean only 75 lbs. when



placed on board (B) and 50 lbs. when placed on board (A).

With this system the sand can be placed in the box until it balances the weight placed on the platform; then another weight can be placed on the platform at the desired spot and can be balanced with cement. The same procedure is followed for lime and coloring, each one balancing its weight. The box being hinged permits easy dumping.

To Pile Cut Stone

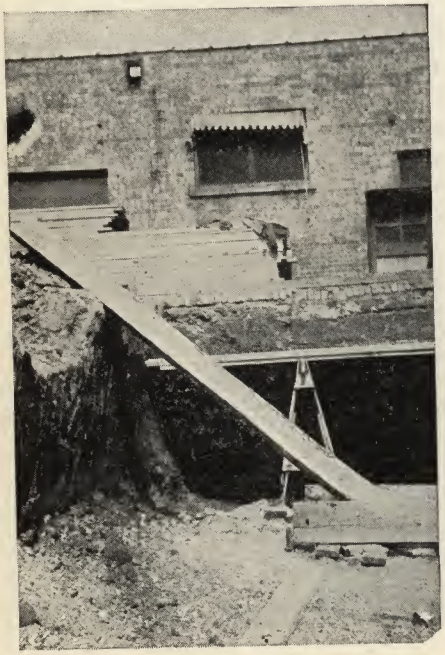
75 It is essential, on jobs where cut stone is to be used for trim, that the stone be protected from damage as much as possible, and this responsibility generally rests with the stone setter. Not only is it necessary to prevent breaking and chipping but

also, in order to save time, it is well to pile the stone so that it may be readily handled without undue damage.

J. O., Jr., a stone contractor of Knoxville, Tenn., piles flat stone as shown in the illustration. He sets a piece of board between the stones at each end so that there is a one inch space between. When the time comes to move the stone a bar may be slipped into this opening, the stone tilted and then lifted, instead of having to force the bar between two stones lying one upon the other, and possibly chipping the edge.

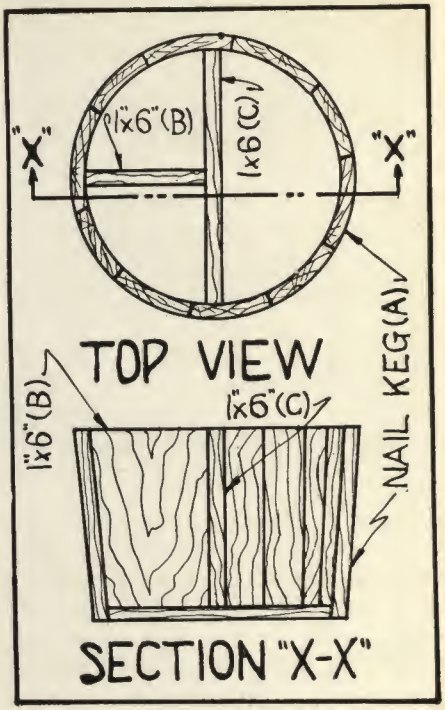
Simple Mortar Chute

76 Sometimes it is inconvenient to bring mortar into an excavation when the hole is small and it may also be impossible to mix the mortar in the excavation because of lack of space. When Charles Weitz & Son of Des Moines, Iowa, find such a condition they mix the mortar on the grade level and chute it into the excavation. The chute they use is no fancy or complicated affair, but simply two surfaced planks nailed together at one edge in the form of a V.



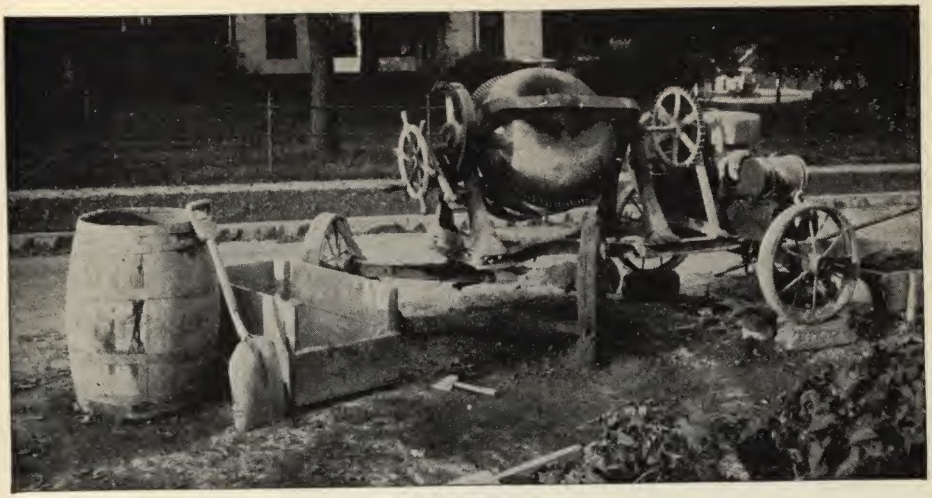
Container for Fittings

77 For the builder who has trouble in keeping his small fittings and parts together this container will prove a boon. The great point in its favor is the low cost for it is made from an



empty nail keg and a few scraps picked out of the waste pile.

In order to make this container, saw off the bottom of a nail keg so that about nine inches of it will be left in the keg shape. Then put in the two 1 x 6″ partitions (B and C) as shown. If one of the staves of the keg is allowed to remain longer than the others it may be used as a handle.



Measuring Cement for Small Mixer

78 When using a small mixer, G. Janssen & Sons, of Peoria, dump the cement into a small box beside the mixer and measure it into the mixer with a shovel instead of pouring it from the bag. This means a more accurately measured mix, and a saving in cement since it is hard to control cement pouring from a bag.

Lumber Hoist

79 Every up-to-date contractor is interested in anything that will increase the profits on his job; that is the reason for the vast increase in use of contractor's equipment in the past few years. Builders are coming to realize more and more that money invested in the proper kind of equipment is money well spent, for nothing is so productive of a good return on money invested as a well-made piece of equipment.

It sometimes happens that some pieces of equipment are not available. Where a device for lifting lumber is needed, the hoist shown here may be built in a short time.

It consists of a 4 x 4″ vertical post (G) which supports a 2 x 6″ cross-arm (A) upon which two loose pulleys (D) are carried.

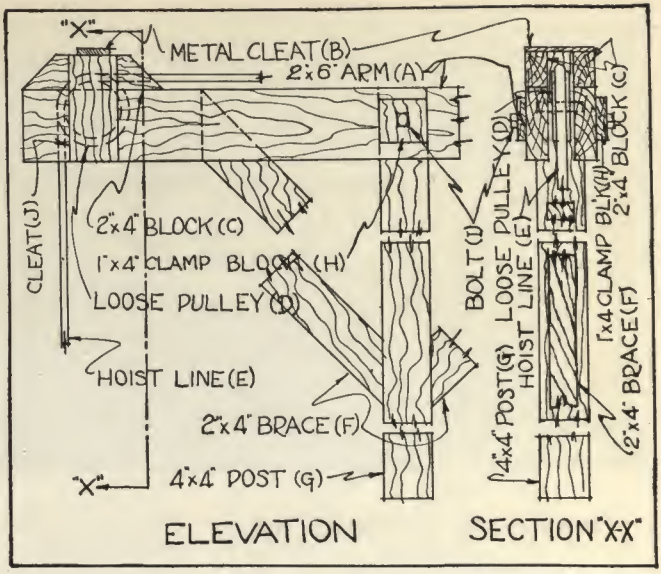
The cross-arm which carries the loose pulleys is built up of 2 pieces of 2 x 6″, one on each side of the vertical

post. Braces consisting of 2 x 4″ run from the post to the cross-arm and serve to stiffen it.

The post has shoulders cut into it at the top in order that the cross-arm may have a firm bearing and thus help distribute the load in a more efficient fashion. These two members are fast-

ened together by means of a single bolt (I) and a 1 x 4″ clamp block (H) is used to assist in making a tight job.

In order to increase the capacity of the hoist the pulleys are not set at the mid-width of the cross-arm but are set above it. A block (C) at the top of the cross arm (A) held to it with a cleat (J) acts as a guide for the hoist-line (E). A metal cleat runs across the tops of the block (C) thus preventing the ends of the cross-arm from spreading. The shaft for the loose pulleys (D) is carried in a metal saddle fastened to the inside face of the cross-arm.



To Keep Sand from Spreading

80 Sand is generally delivered on the job and dumped at several points, no effort being made to confine it. It is not long before the wind, workmen stepping over it, or children playing upon the pile, soon scatter the sand far and wide, with a result that quite a bit of it may be lost.

Chichester and Co., builders of Birmingham, Ala., are aware of these facts and so have set up a few planks as shown in the photograph to keep the sand pile within limits. These planks really act as a retaining wall and thus a great deal of sand can be dropped on a small area, since the retaining wall permits piling the sand high without spreading it.

Convenient Lime Storage Pit

81 Instead of cluttering up the job with lime boxes and piles of mortar, this contractor sets his mortar boxes inside the building and uses part of the excavation as a lime storage pit. It is necessary only to line the pit with some boards to keep the mortar clean. Notice that the mortar boxes are so placed that the finished mortar can be dumped directly into the pit.

Getting Whole Bricks Instead of Bats

82 Bricklayers as a rule do not like to work with bats, and to increase the efficiency of his workmen, a good contractor will always try as far as possible, to prevent the breaking of brick.

J. A. McK. throws a few planks together, as shown in the illustration and has his man dump the wheelbarrow into this chute, thus sliding the brick into the excavation instead of dropping them. The result is fewer bats and consequently a somewhat lower bricklaying cost.

Handling Heavy Columns

83 Instead of allowing heavy steel columns to lie flat, it is best to set them down in the manner shown here. Not only is the column easier to handle when it is to be set in place, but also a column set down in this fashion is not liable to suffer a damage to the cap plate.

The chair upon which this column rests is nothing but a few pieces of scrap and it is not even nailed together. Thus the only labor necessary is the couple of moments required to pick up a few blocks.

Shed for Storing Face Brick

84 It is unwise to leave face brick exposed to the weather, since wet face brick is apt to slip when it is set in place and cause an uneven looking wall to say nothing of a bad job. Face brick should be kept dry and piled neatly so that they will not be broken. Broken face brick are just so much waste, and when brick costs from three to five cents apiece it is worth while to take good care of them.

E. S. builds the brick shed shown in the illustration, for protecting brick from the weather. The shed is open on the street side so that the brick can be unloaded from wagons, and protected by a few boards which are nailed loosely on the sidewalk side. The roof is nothing but some 1 x 6″ flooring laid with a one or two inch lap, so that the water runs off.

Another Lumber Hoist

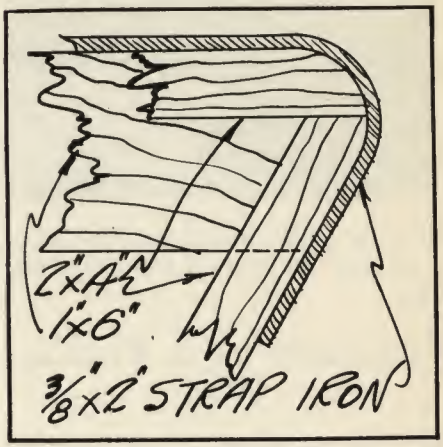
85 E. E. K., a contractor of San Diego, Calif., claims to have a money saver in the lumber hoist shown here. Instead of handling

lumber from one floor to another, as is commonly done on jobs of moderate size, this lumber hoist was built with the idea of doing the work in a more efficient fashion.

It was operated from the same engine used to run the material hoist. Such a piece of equipment as this can be very easily made by any contractor who finds need for it.

This hoist can be made on the job by regular carpenters and, once built, it can be knocked down and moved and then re-assembled. The size of the members used depends, of course, upon the height to which the hoist is to be built and upon the weight of the material it is desired to elevate at each load.

For the job shown here, this hoist

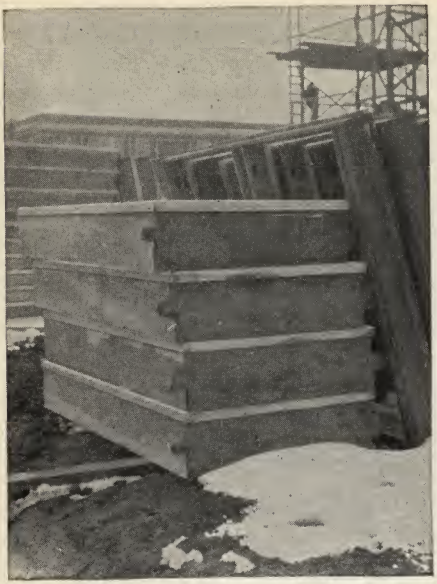


was called upon to lift at one time, three joists, their dimensions being 3 x 12 x 22″, a load of about 1500 or 1800 pounds. The main verticals were built of 4 x 8″, the horizontal bracing of 2 x 4″ and the diagonal bracing is of 1 x 8″ material.

Handling Window Frames

86 Many a cuss word has been used on account of the difficulty in handling heavy window frames.

Since most of the trouble in handling frames comes from the difficulty in getting hold of them, the mill ships these to the job with a projecting ear at the sill. This projection affords a means of gripping the frame and assists greatly in handling it easily, and



when the frame is in place it takes but a moment to saw off the projecting piece.

Protection for a Finished Wall

87 It sometimes occurs that finished walls are damaged by hoisting materials up over the outside of the building. A piece of cut stone going up the wall may bump and chip a piece of trim, leaving an ugly mark which cannot be removed.

The McCandless Miller Co. take no chances on anything like this. When hoisting material up the outside wall, the space is protected by planks.

Piling Pipe

88 To the contractor who finds it necessary to pile pipe or reinforcing bars in a small space this kink used by the C. S. Mersick Co.,

of New Haven, Conn., should prove helpful. A piece of strap iron, one-quarter inch thick and about two inches wide is bent at the ends.

These irons are placed in the pile as shown in the illustration. The vertical ends keep the bundles of pipe from rolling and serve to make the whole pile solid. They are inexpensive and indestructible and by their use pipe or reinforcing bars may be piled to considerable heights in a small space instead of piling them between stakes or in racks as is usually done.

CHAPTER VI

Short Cuts in Carpentry

BECAUSE such a large percentage of the work on a building is performed by carpenters, it is reason enough that we should look with favor on any short cut in doing any branch of this work. Here is a fine collection of ideas and one or more of them can be applied on practically every job. In these days it is necessary to save money wherever one can possibly do so and these short cuts will help.

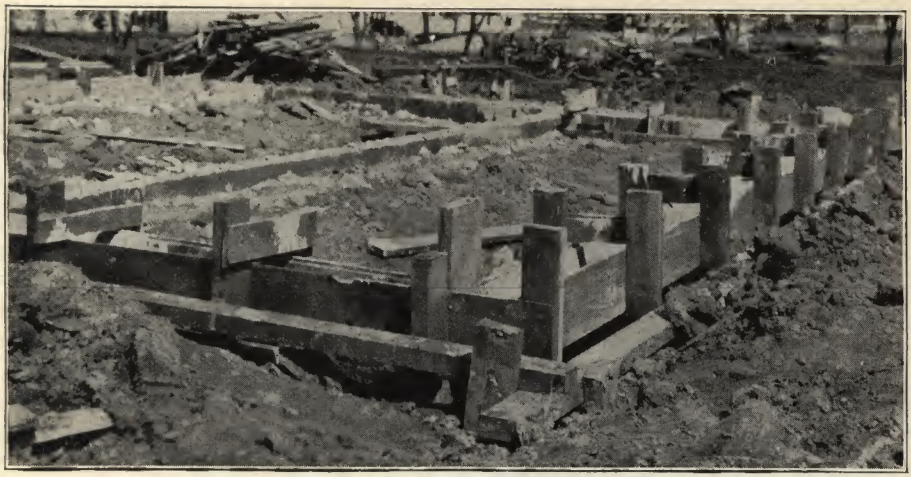
Formwork for Shallow Foundations

89 In cases where basements are not built, the only excavation required for the foundations is a trench. In the event that it is necessary to carry the foundation above the grade level some sort of formwork must be set up above the trench to confine the concrete when it is poured.

The formwork used by George L. Crawford & Company, Dallas, Texas, contractors, is well suited to this kind of work. The forms are nothing more or less than two pieces of 1 x 10″ shiplap nailed together with 1 x 4″s spaced about four feet on centers. The 1 x 4″s provide not only a handle for moving the form about but also a place to which braces may be nailed when the forms are set in place.

More on Formwork

90 For buildings such as small garages or out-buildings where only a low foundation wall is required, this formwork would seem to be as simple and inexpensive as can be built. It is constructed of a dou-



ble row of vertical 2 x 4″s, held at the top by short crosspieces and prevented from spreading at the bottom by the long 2 x 4″s which make one side of the form. A 1 x 6 board on the inside face of the 2 x 4″s is the only other lumber required.

To build this form the long 2 x 4″s are laid on the ground and held in place by stakes as shown here. With these 2 x 4″s as a guide the excavation for the footing is made. Then the top form, consisting of the short pieces of vertical 2 x 4″s, the 1 x 6″ side forms, and the top cross pieces, is set between the long 2 x 4″s already staked in place.

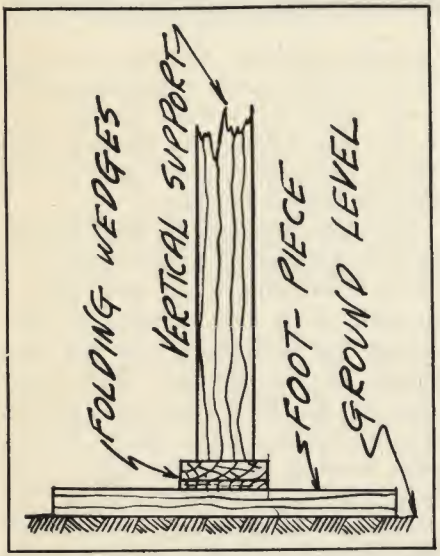
This top form may be built beforehand and placed as a unit to save the labor of building it up each time it is used. It is held in place by toenailing the short 2 x 4″s to the long pieces on the ground. The lower edge of the 1 x 6″ and the bottom of the short 2 x 4″s come to the same level as the under side of the long 2 x 4″s. A comparatively dry mix should be used lest the concrete flow out of the forms at the opening and interfere with smooth operation.

Solid Bases for Concrete Formwork

91 The big difference between a successful contractor and an unsuccessful contractor is the fact that the successful man gives attention to details while the man who meets with indifferent fortune generally neglects them.

In no work is attention to details so important as in reinforced concrete construction. Strict inspection and constant observation are necessary if good work is desired.

A point often slighted by those engaged in concrete work is the bearing for the form supports. Many a time the writer has seen a contractor scratch his head in wonder because of a poor job where something happened to throw the forms off level. If that man had taken the time before the concrete was poured to install a firm base for his form leg,



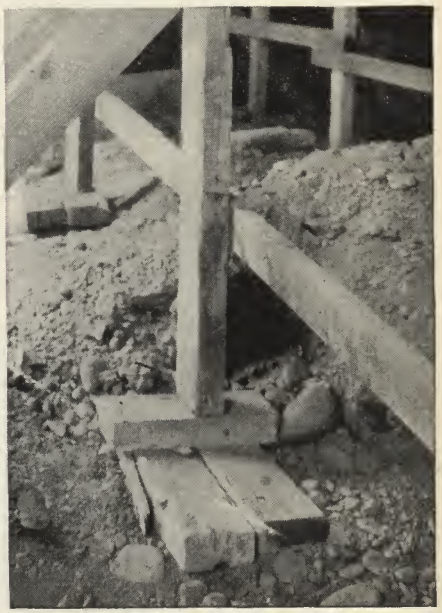
such as is shown here, the trouble might not have happened.

This photograph shows the way a form leg should be set. Note that the leg rests on a piece of 2 x 4″, which in turn rests on two other pieces of 2 x 4″ at right angles. The single piece upon which the leg rests provides for a good distribution of the load to the two pieces below it and these in turn tend to spread the load over a large ground area, thus reducing the amount of load per unit of area. For instance, if the 2 x 4″ rested directly on the ground and had to support a load of 200 lbs., the load would be distributed over eight square inches, which is the area of ground covered by the 2 x 4″ leg.

Dividing 200 by 8, the resultant pressure on the ground would be 25 lbs. per square inch. Now, if the ground were only capable of withstanding a pressure of 20 lbs. per inch, the form leg would tend to sink and the forms would be distorted.

Suppose, however, that the leg rests on the ground as shown in the illustration. The load comes through the leg to the first piece of 2 x 4″ whence it is distributed to the other two pieces at right angles. If the two lower pieces are two feet long the ground area covered by each is four inches by 24 inches, or 96 square inches. Since two pieces are used, the total ground area covered is 192 square inches.

Now if a load of 200 pounds is put

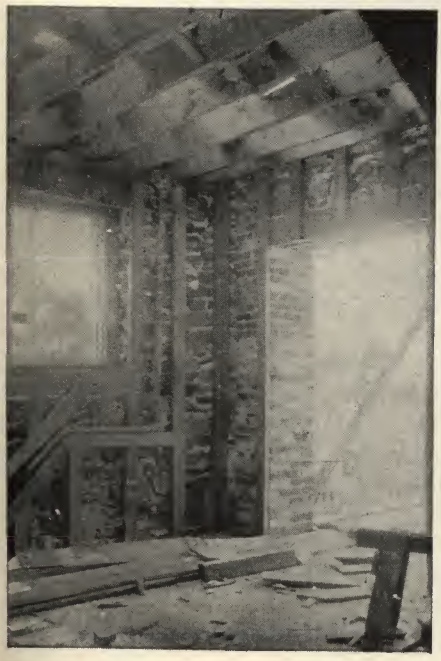


upon the form leg the load upon the ground will be only a trifle more than one lb. per square inch. And if the ground is capable of supporting 20 lbs. per square inch, it will be seen that the leg will not sink into the ground and forms will not be distorted when the concrete is poured.

Two pieces of 2 x 4″ are used at the ground instead of a single piece of 2 x 8″ because by so doing a firmer base may be obtained on uneven or loose ground. If folding wedges are used under the leg as shown in the sketch, the forms may be leveled after they are set.

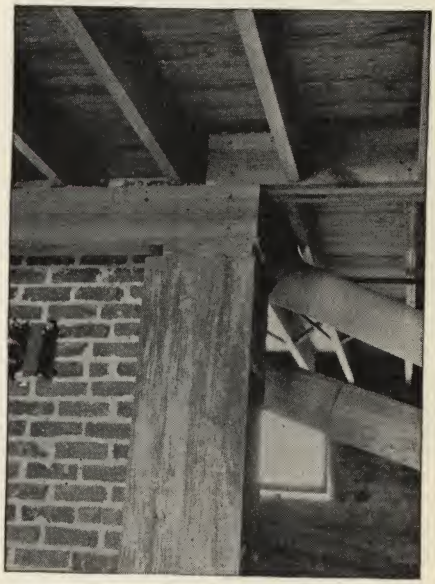
Furring for Rubble Walls

92 A building with solid stone walls presents some very interesting details not the least of which is the way the walls are furred. A stone wall is very rough and therefore ordinary 1 x 2″ furring is out of the question because it would hardly be heavy enough to carry the lath over the rough places and besides it would be exceedingly difficult to fasten to the stone wall.



M. G. S. sets furring in stone buildings as shown in the accompanying illustration. Note that all furring strips are 2 x 4″s and that they are set independent of the wall.

They actually form a system of interior framing. They are necessary, however, if a good lathing base is desired. Note especially how provision is made for piping.



Providing Head Room in a Basement

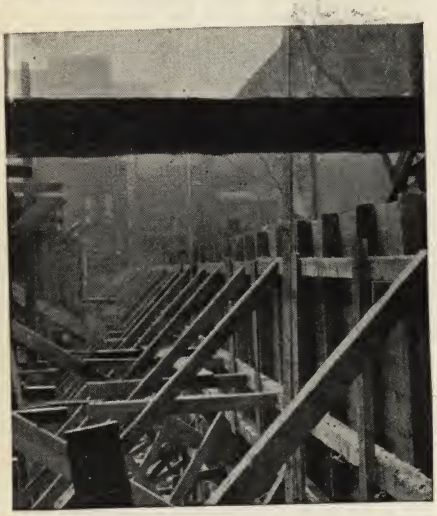
93 In the construction of a large number of buildings at Louisville, Ky., by the J. & J. Realty Co., the furnace location happened to come directly under the main girder and it was found that there was not sufficient head room to provide for a proper installation.

The difficulty was overcome by

setting one girder over another at the columns and framing the floor joists into the raised girder instead of allowing them to rest on top. Thus an additional 10 inches of height was provided. Note that the basement columns are concrete and that the girders are built up of 2 inch joists.

Strengthen Form Bracing

94 To provide greater strength for their foundation forms, the Morris Construction Co. used the



method shown in the accompanying illustration of notching the braces where they bear against the form ribbon, the brace bearing upward and outward.

Braced Frame Corner

95 The strongest part of a building should be the corner and it is surprising to note how many contractors fail to take notice of this fact. The illustration shown here is of a corner post on a braced-frame construction building. Note the

heavy corner posts and the diagonal bracing which serves to stiffen the corner.

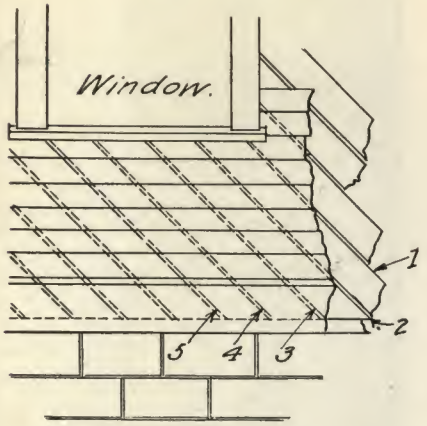
On Diagonal Sheathing

96 A. J. H. says that this is not an argument for or against diagonal sheathing but merely calls attention to a detail overlooked by many builders who use diagonal sheathing.

When same is put on and boards allowed to run out at bottom to lower edge of sill, as most builders do, there is an open air lane along the joints of the boards, as at 1 and 2 in the figure which allows air to pass up to windows and doors and causes drafts.

This, of course, is more marked with boards than with matched flooring or shiplap but the shrinkage will make a very pronounced air lane

even with matched stuff. Nailing a strip at bottom of sill and then butting sheathing boards to that will



overcome this defect, as outside base covers and makes tight joint, and closes the air lane as shown at 3, 4, and 5.

Temporary Girder Support

97 It is sometimes necessary to support a girder temporarily and various schemes are used for the job. The illustration shown here tells how one contractor does it.

Two studs, cut a bit longer than the distance between the basement floor and the bottom of the girder are used to support the load. The studs rest on a short plate so that a firm base is assured. They are placed against the under side of the girder, and then set on the plate.

In order to level the girder, all that is necessary is to drive the foot of the studs forward or backward on the plate. When the proper level has been reached a cleat is nailed across the studs to hold them in position.

This method of support serves not only to hold the girder at the proper level, but also to prevent its tipping sideways as the two studs are really diagonal braces and the whole assembly of girder, studs and cleat, acts like one end of a mason's horse. When the support has served its purpose the studs may be used elsewhere.

Bracing Walls in Frame Building

98 Frame buildings with walls built on studs require some form of bracing to hold the line of studs in place until it is strengthened by the sheathing and floor joists. Here is a simple system of bracing and a very efficient one, too.

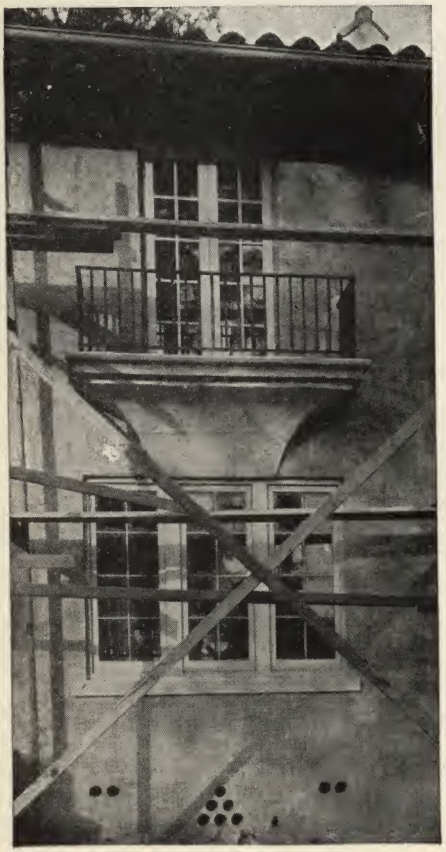
They nail a 2x4″ cleat on the rough floor and use it as a base upon which to nail one end of a brace which runs to the upper part of the wall.

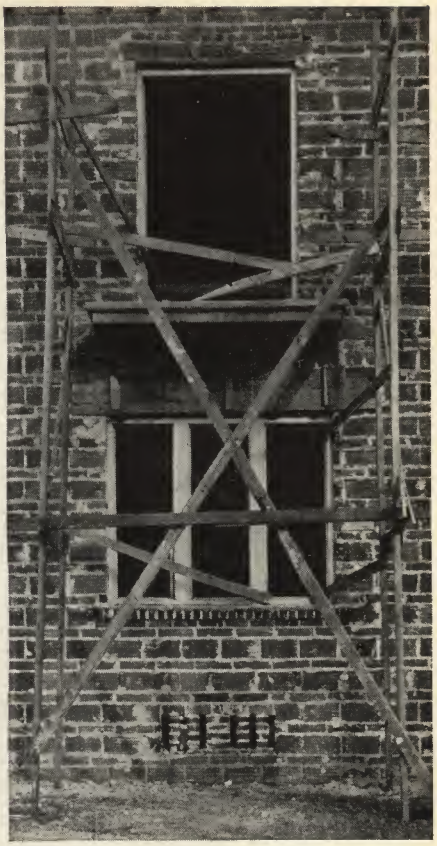
These braces are set about 16 feet on centers along the length of the building and are braced against each other by diagonals, thus strengthening them in the center.

Providing Support for Small Platform

99 In the Spanish or Italian type of residences the style of architecture demands certain things in the way of ornament that are not common to other architectural types—for instance, the small ornamental platform shown in the photograph below.

These illustrations were made in Jacksonville, on a job being done by





the Better Homes Co. The job involved the construction of a hollow tile house of the Spanish type of architecture and as part of the ornamentation of the front and side elevations it was necessary to build small platforms as shown. The illustrations show the job after the stucco was applied and the details of construction for the platform.

In order to provide proper support the floor joists are extended beyond the wall, faced with sheathing and then the concrete slab which formed the floor was poured. The ends of the joists were cut sloping so that the base of the platform could be built as shown.

It might be well in some cases to

bring the platform floor all the way back into the building and cast it as a unit with the wall, reinforcing the slab with a few steel rods.

Extending Sheathing to Provide for Scaffold

100 J. K. is a builder who believes in using as many labor saving methods as possible and here is one of his ideas.

Instead of building a scaffold with posts and braces for his carpenters

to work upon he merely extends every tenth piece of sheathing, lays planks across and has a solid scaffold without going to the trouble of building it up from the ground.

When the scaffold has served its purpose the planks are removed and projecting pieces sawed off.

Framing for a Telephone Opening

101 It has become the vogue to install special niches in the wall for the telephone and the manner of framing shown here seems to be as simple and easy as the job can be done.

The lower shelf is nothing more or less than a piece of 2 x 4″ nailed between the studs and the arched top is formed by setting two curve-cut pieces of 1 x 8″ or 1 x 10″ according to the diameter of the curve, in notches in the studs as shown. It is recommended that metal lath be used around the top as this material lends itself well to bending and for this kind of work may be somewhat easier to apply than wood lath.

The idea of a telephone niche should appeal to the contractor who builds houses to sell. It is a convenience that may be installed at a very low cost and besides its actual utility it should prove an excellent point. In the average home the telephone is usually on a small table in the hallway, with the result that it occupies space.

The telephone niche solves the problem by providing a shelf where the phone may be set without in any way occupying valuable hallway space.

Framing for an Interior Arched Opening

102 The Mountplaisir Building Company of Fargo, frame wide interior arched openings as shown in the photograph. They saw two planks to the curve of the arch as shown and carry the load above the cut plank by two pieces of 2 x 6″.

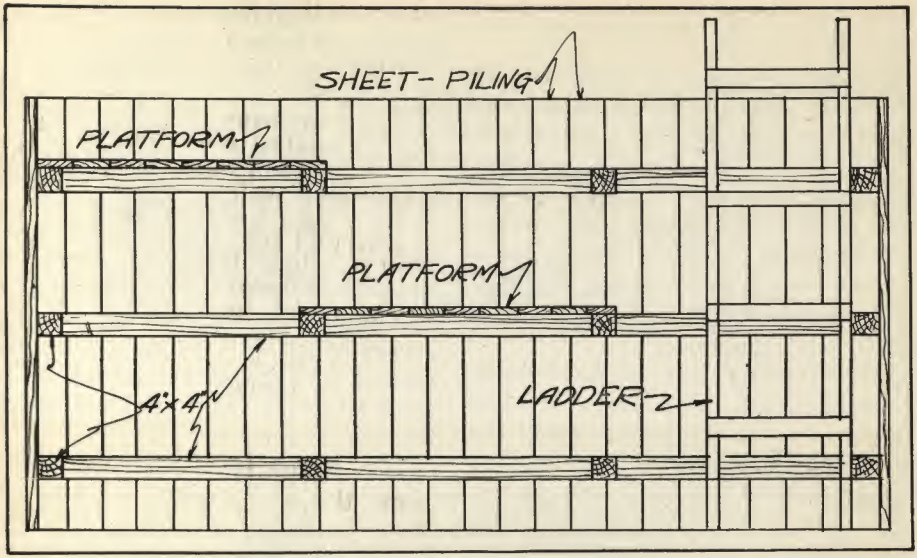
The sawed planks which form the curve of the arch are not strong enough to support the load above because the greater part of their effective section is cut away. The 2 x 6″s above the cut piece are depended upon to carry the entire load over the opening, the two lower planks being used only to form the curve.

An Underpinning Well

103 Where an excavation is to be carried below an existing foundation, underpinning is always necessary to prevent the collapse of the adjacent building. In ordinary soil the foundation is generally underpinned a few feet at a time by digging wells along the wall line, excavating under the foundations and filling that part of the excavation under the foundation with concrete.

Where these wells are to be carried to a depth of six or eight feet they are best constructed as shown in the accompanying sketch.

It is too much to expect a man to shovel dirt from one level to another level six or more feet above, and the work is most efficiently carried on in the following manner: Two platforms are installed in the well as shown. The dirt is shoveled to a man on the first platform who in turn sets it upon the next platform, or on the grade level as the case may be. Thus one man is required to lift the dirt only a short height and does not become exhausted as would be the case if he had to lift each shovel full from his feet to a point above his head.



The well is protected from cave-ins by a 2 x 6″ sheeting which is placed within horizontal lines of 4 x 4″s. These 4 x 4″s should not be spaced farther apart than 3 or 4 feet on centers if the excavation is to be carried to any depth, since considerable bracing is required to offset the earth pressure.

This question of earth pressure is not one to be passed over lightly and is very important where excavations are to be carried to any considerable depth. Earth pressure increases with the depth and where underpinning is to be taken down to a considerable distance, the space between the horizontal timbers, or wales, as they are commonly called, is reduced.

They are placed close together and their section increased to greater than 4 x 4″ to offset the increased pressure. The lateral bracing which spans the width of the well is also increased. This provides all the safety necessary for such work.

For a Clean Floor

104 Wood is as tender toward dirt as white paper and should be amply protected. Of course protection can be carried to extravagance but generally it pays pretty well in time and dollars. The writer once thought ceilings inviolate until someone thoughtfully dropped a tool into a pail of brown mortar. R. E. J. contributes this one.

After having lots of hard work cleaning floors when plasterers had finished he found it paid to cover the floors with building paper as soon as the studs were set, placing it directly up to the studs. The paper is held down by means of lath nailed to the floor with brads. After all the dirty work is done take up the paper, tearing off at the plaster line. This leaves a clean floor.

Leveling Floor Girders

105 One of the many contributory causes to squeaky floors is improperly leveled floor girders. While not directly responsible, they do, nevertheless, throw the floor off from a level plane which is the theoretical ideal of a properly laid floor. It therefore behooves contractors to pay some attention to this item and to keep the top face of the floor girder level.

There are many ways of doing this but the method shown here seems to be a simple and easy way of doing it well. Two points are set at the proper height with a level at the beginning and end of the girder and a piece of chalk line stretched across the two level marks.

The girder may then be either jacked up and wedged, or lowered, until the edge is equidistant from the chalk line throughout the length of the girder.

Roughing-In for Tile Floor

106 The type of floor commonly found in bathrooms is generally of small octagon tile. In order to keep the level of the tile floor the same as the level of the wood floor in the hallway, the type of construction shown here is

recommended. Furring strips are nailed to the joists about three inches below the top edge and pieces of 1 x 6″ are set between the joists to rest on the strips.

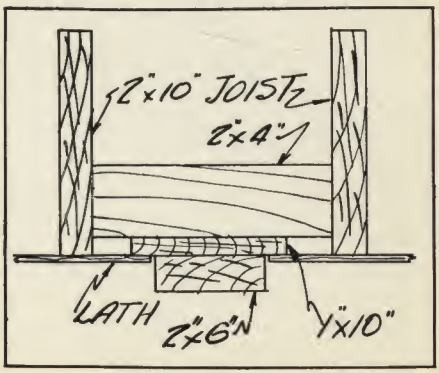
The top edges of the joists are pointed off as shown in the photograph in order to have as little wood as possible in the cement sub-floor, which is laid directly on the rough wood floor. Too much wood in the cement floor may possibly result in cracks after the tile is laid, due to the contraction of the wood after drying out.

Framing for False Beams

107 One contractor had a client who wanted false beams, exposed for about one inch, in the living room of a new house which he was building. As will be seen from the illustrations, the means of providing the exposed false beams was a very simple matter. Short pieces of 2 x 4″ were set between the joists as shown in the sketch and to these 2 x 4″s, spaced about 4 feet on centers, was nailed a 1 x 10″ board.

The 2 x 4″ was so located between the joists that when the board was nailed to it the under side of the board was at the same level as the lower edge of the joist. Then a 2 x 6″, which formed the exposed beam, was nailed to the board.

Since the face of the board is at the same level as the lower edge of the joists the lathing can be carried straight across. The projection of the 1 x 10″ beyond the 2 x 6″ allows for a projection to which the ends of the



lath can be nailed. It is necessary, of course, that these false beams suit the length of the lath, otherwise it will be quite a job to cut all the lath used in the ceiling to the proper length.

A similar method might be used to provide a solid nailing for cased beams built of several members in the usual manner.

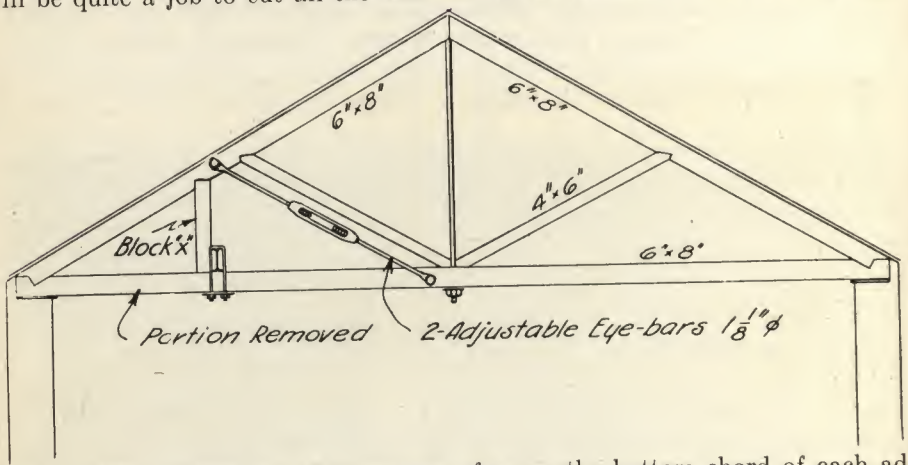
Cutting Off Roof Truss

108 In a manufacturing plant not long ago a conveyor was installed to lift manufactured goods from a weave shed to the third story of an adjoining building. In order to erect the conveyor a hole had to be cut through the roof of the one-story building and a housing erected over the opening, extending same up to the third-story height.

The building was adaptable for this change save for a single difficulty.

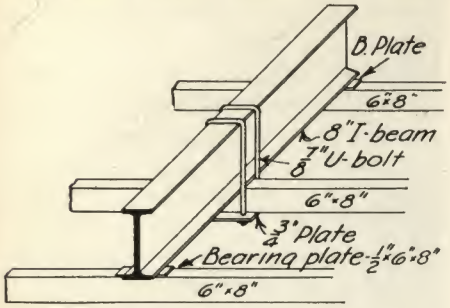
The only obstacle was that one of the roof trusses of the one-story building came exactly in the center of the proposed opening, and it was necessary to cut off about 3 feet, 6 inches of the truss. The method employed may be of interest.

The roof trusses were similar to the one shown and were placed 8 feet on centers. In order to cut off one truss it was necessary to carry it from the trusses on each side. Therefore on the bottom chord of each adjacent a ½-inch plate, 6 x 8-inch, was set as shown and an 8-inch I-beam was run through the three trusses, bearing on the outside pair.



Two U-bolts, ⅞-inch diameter,

were then dropped over the I-beam on opposite sides of the truss to be cut, and a ¾-inch plate, drilled to suit, was placed under said truss,



and the bolts passed through and made fast. The center truss was thus carried by the I-beam.

Then block X was set between the top and bottom chords, forming a sort of end post or strut. Next 1¼-inch holes were bored through the top and bottom members of the truss, and two 1⅛-inch adjustable eye-bars were bolted fast to the truss, one on each side, using a pair of 1¼-inch bolts as pins. The turnbuckles were brought up taut. The hole in the roof was then cut and the truss cut off as shown. No movement or change in the shape of the truss was visible, and the housing was erected as desired.

To Lay Hard Wood Floor Using Short Pieces

109 Some carpenters like to lay their flooring in a line running the length of the building. They start at one end, lay down eight or ten widths, and then carry this line clear to the other end of the building.

Not so, however, with the carpenters employed by W. G. R. His men lay hardwood flooring as shown, starting at the end of the building and carrying the flooring across the width until they have built up a long slanting line. They then carry this line right along to the other end of the floor. Thus, they move continuously instead of going from one end of the building to the other, and do not waste time coming back to the

starting point when the end of the line is reached.

They also find it more convenient to use up the smaller pieces of flooring by working them in as they go along. Any method of floor laying whereby the short pieces can be worked in is sure to be welcomed by the carpenter and this idea is presented here in the hope that it may be useful.

It would seem, too, that laying flooring as shown here would provide a tight floor. Where the floor is laid from one end to the other in strips, it may be possible for it to loosen a trifle before the entire width is laid, but by laying the floor as shown here, the full floor width is reached soon after the laying is begun and the whole floor is wedged from one wall to another.

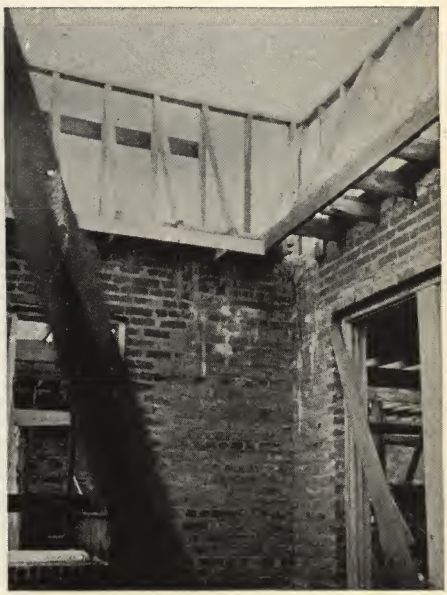
Furthermore, this system ought to eliminate much of the squeaking often noticed in wood flooring, which is a defect that is bound to reflect on a builder's craftsmanship, inasmuch as it is very noticeable to those using the floor.

Framing Overhang for Tile Roof

110 There are many ways of framing an overhang for a tile roof and we show here a method used by the Massel Realty Co., to frame the tile overhang for the Doctor's Building at Atlanta, Ga.

Where possible, the roof joists are allowed to run through the brick wall far enough to provide a nailing base for the 2 x 4″ diagonal supports to which the sheeting is to be nailed. The bottom of these diagonals frame into the protruding joists, and the tops into vertical 2 x 4″s. These vertical studs are toe-nailed to a sill which is nailed to the protruding joist at the wall, and held rigid at the top by a 2 x 4″ plate. They may be allowed to run past the top of the joist and be nailed to the face.

Where the overhang is to be placed



on a wall which runs parallel to the roof-joists, small sections of joist, running through the brick wall, are framed into an extra-heavy or a double joist, which runs parallel to the wall as shown. The outside corner is built up on a diagonal joist running through the wall and framing to the heavy joist inside.

The manner of handling the outside corner framing is shown in another figure. This method is as simple as any and provides a strong foundation for a heavy roof.

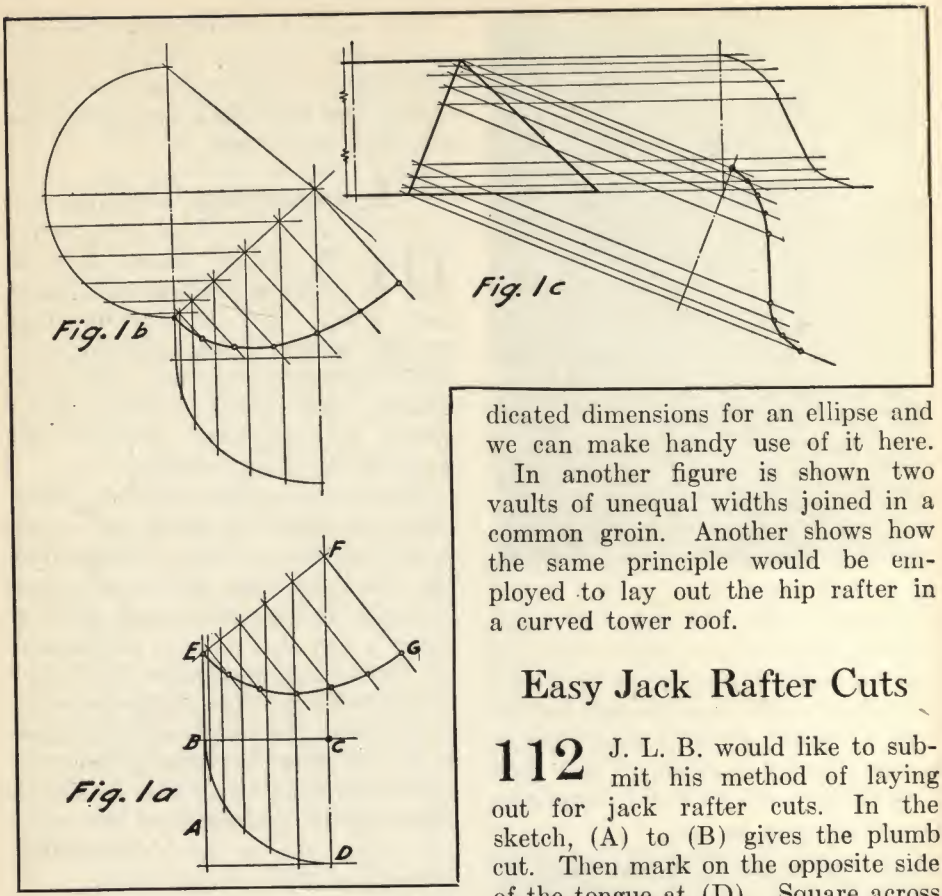
Intersecting Vaults

111 A. N. P. comes forward with a solution to a common query. It concerns drafting out hip rafters where one dome or vault intersects another. Or in a church with dome ceiling where arches and windows intersect the dome of the main building.

This is a problem that in some form or other is faced by every active workman. Let us keep that idea in mind, take the steel square in hand, and see if we can draft it out in a way that we may understand the "why" and remember the "how" of the drafting. Two things we want to know are the length and the shape of the rib where two vaults come together (groined) and this is determined by the character of the common curve just as the hip or valley depends on the common rafter.

Take two vaults, each a semicircle. Let (A) represent one-half the window or similar part of main building. (B-C) is the run and (C-D) is the rise of the curves to be joined in the plane (E-F). And since the vaults are similar, the plane of the hip or valley or groin is 45 degrees. Its length or run will be the diagonal of a square with the side (B-C). The rise must be the same as (C-D) to conform to the same elevation.

Now we have the springing points of the arches at the level (B-C-E-F) and the highest point at (C-D). We also have the curve of the vault at (A). We have the base for another



arch at (E-F) which is almost a half larger than (B-C) and with the same rise.

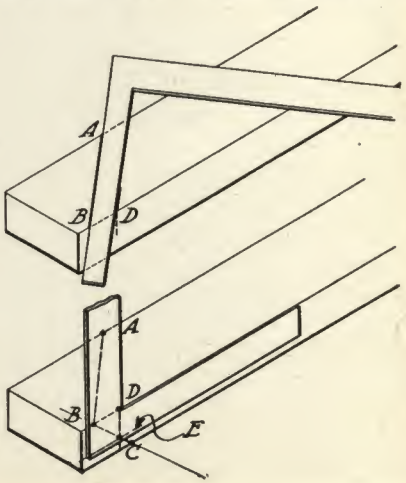
Now to get the "square" idea into it, measure out on the line (B-C), say 12 inches, and square up to meet the curve. We want the same height above a common point in the plan of the "hip," but to get out on that line by using the square we must take the diagonal of 12 inches, or 17 inches, then square up and work the same distance for a point in our curve for the groin. And in like manner fix any number of points for the diagonal curve.

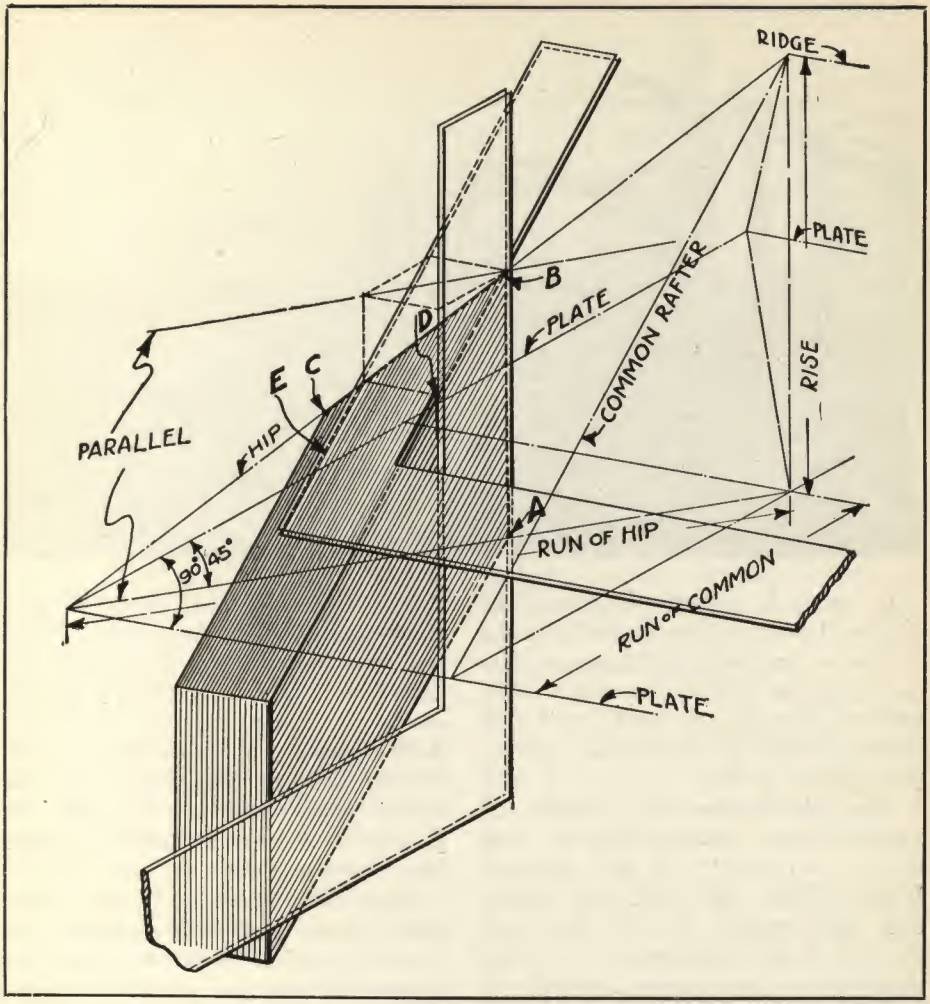
When we have laid out points for the diagonal (E-F-G) we have indicated dimensions for an ellipse and we can make handy use of it here.

In another figure is shown two vaults of unequal widths joined in a common groin. Another shows how the same principle would be employed to lay out the hip rafter in a curved tower roof.

Easy Jack Rafter Cuts

112 J. L. B. would like to submit his method of laying out for jack rafter cuts. In the sketch, (A) to (B) gives the plumb cut. Then mark on the opposite side of the tongue at (D). Square across at (B) and (D). Lay the tongue on





the edge of the rafter and mark line (E). The cheek or side cut will be from (B) to (C).

A supplementary sketch aims to show the principle of the cut. Notice the line running to the left from the point (B) which is parallel to the rim of the hip.

Bracing for Window Frames

113 Some jobs have a most unpractical look while the walls are going up. The way some masons support window frames, holding them in place until they can be built into the walls, seems to be without any reasoning or forethought. Looking down the length of wall, one sees nothing but a forest of poles and a maze of cross pieces.

If you will notice the photograph which was taken on this job, you will see in what an orderly fashion the temporary window frame bracing has been built. The main support is furnished by vertical 2 x 4″s, one of which is set opposite every frame.

In order to steady these vertical pieces, braces are nailed both ways, as shown, and a lateral brace is carried from one post to the other. The window frames are held by 1 x 6″ boards nailed to the frame and to the vertical posts.

The advantages of a system of window frame bracing like the one shown are not only the well plumbed frames, which will make sash fitting easy later on but also the fact that the job is not blocked by a lot of cross pieces and posts, running in all directions, which interfere with the workmen. It would seem that the advantages derived from this system of bracing are well worth the added expense in building it.

Drop Siding or Bevel Siding?

114 We feel sure that many readers will be interested in the following letters concerning the merits of bevel siding and drop siding. The argument, in its character and tone, shows more clearly than any intentional publicity could that industrial associations are always alert to suggestion. The first and third letters are from Mr. L. F. Steves, of Kennedy, Texas, and the second and fourth are from Mr. T. F. Laist, of the National Lumber Manufacturers' Association.

From Mr. Steves: "I was very much interested in your article in the December issue, 'How the Consumer Wastes Millions of Feet of Lumber.' Using short and odd lengths is all very good, but there is another way of saving millions of feet annually and that is by the manufacturer to quit making the so called drop siding and go to making bevel siding only in place of it, as they can take a piece of 1¼ x 6-inch and make two pieces of ⅝ x 6-inch bevel siding and it takes a piece of 1 x 6-inch to one piece of drop siding.

"There would be quite a saving in this and there is lots of siding used, especially in the South.

"Besides, the bevel siding makes a much better wall than the other, and the mill can furnish it for less money. It is an economy worth considering.

"If you can bring this to the attention of someone that has more influence, I will feel that my poor effort has not been wasted."

From Mr. Laist: "Referring to the letter of L. F. Steves of Kennedy, Texas, which you forwarded to the Practical Size Investigation Committee, in which he suggests that millions of feet of lumber may be saved annually by ceasing to manufacture drop siding and making bevel siding only.

"He claims that two pieces may be made by using a 1¼ x 6-inch board and that it takes a 1 x 6-inch to make drop siding having the same superficial area. This is undoubtedly true, but the writer must recollect two things: first, that the manufacturers must produce what the public wants; and, second, in many localities bevel siding is not in demand and a dealer would have great difficulty in selling anything but the drop siding.

"Furthermore, the statement that bevel siding is better than drop siding depends entirely on the point of view. Bevel siding cannot take the place of drop siding. Many millions of feet of the latter are used without sheathing, the drop siding being of sufficient thickness to stiffen the frame and afford a wall covering of sufficient strength to be used without an underlayer. This is not true of bevel siding, which must always be used on top of sheathing.

"All through California and the Southern States drop siding is nailed directly on the studs in residence work and even in the colder climates is used for barns, sheds, summer cottages and rural structures very largely in the same way."

From Mr. Steves to Mr. Laist: "Replying to yours of the 1st inst., in regard to bevel drop siding you say the manufacturers must produce what the public wants. I know that to be true, but in nine cases out of ten the owner never says what he wants in the way of siding, but leaves that to the contractor or architect if he has one, and I am sorry to say that most contractors will use drop siding because he can put up more of it in a day and use any saw and hatchet man to do the work. Only very seldom will he cut it to the casing and corner boards, but puts them over it, leaving spaces for the wind to blow in and dirt and spiders to accumulate behind it, as very few will nail wind strips on the ends of siding around the openings.

"As to bevel siding being better will say first, you get more lap. (Have seen drop siding shrunk so that there was only ⅛ to ¼-inch lap on walls of dormer windows.) I have seen wind blow rain through over the lap.

"As to stiffness, ⅝ x 6″ bevel siding is certainly as strong as the No. 117 drop, more of which is used in the South than any other. (Have seen board crack the full length.)

"You say that sheathing must be used under bevel siding. That is not necessary at all, as I could show you thousands of houses where it is nailed directly to the studs with 8-inch shiplap and wall paper on inside, as there is very little plaster used in the South.

"Have seen two-story houses on several occasions that storms blew off the piling or brick, where bevel siding was nailed directly to the studs, and there was nothing on the

inside of the walls (not finished) and they were not damaged to any amount.

"Have followed the trade for thirty years as a carpenter, practically all of that time in the South."

From Mr. Laist to Mr. Steves: "I have read with a great deal of interest your letter on bevel siding.

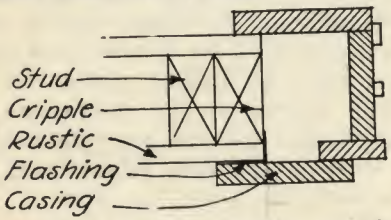
"I can assure you that we appreciate a discussion of this kind, even though we cannot always agree. I often regret that so few of our practical and experienced men in the building and lumber trades do not take their pens in hand more often.

"I think a great many controversies are often due to differences in viewpoints and sometimes our conclusions are circumscribed by our personal experience which may be at variance with those of others.

"It would be interesting to note what others have to say of the relative merits of bevel and drop siding, therefore I am in hopes that your letter will arouse some interest on the part of others."

Setting Window Frames in Rustic Houses

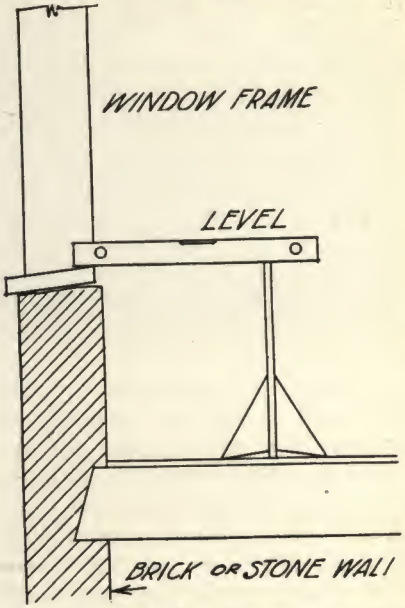
115 A. B. R. thinks he has a "better and cheaper way of setting window frames in rustic houses than the average." Cut the



rustic flush with the cripple, and then nail a common flashing tin over the ends of the rustic before setting the frame. This makes the frame weather-proof at a very small cost.

Setting Window Frame in Stone or Brick

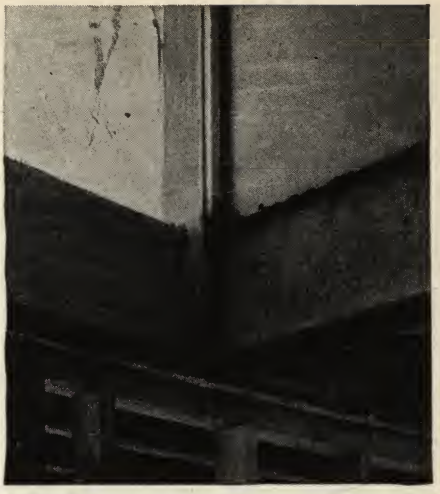
116 The following relates to the use of a dead-man in setting window-frames in stone or brick walls and doing it accurately.



Setting a window frame on a stone or brick wall the right distance from the floor is rather a task. Often times a piece of wood of suitable length is cut and used to level from. Sometimes this is held out of plumb and the result is not the right level.

A way to overcome this is to make what is commonly known a dead-man. Cut a piece of 1 x 6″ the right length from the floor to window sill and nail a small triangular brace on each side, keeping the bottoms flush. This will stand perfectly plumb. It is also very helpful when one man is leveling the window frame. He can set the level on the dead-man and one side of the frame, making that side level and then leveling across the frame.

Fixing Door Frame Firmly at Base



117 In order to avoid setting nails in the jamb, the Enterprise Realty Company of New Orleans, builders, arranged to have this door frame extended below the floor line.

The frame was ordered about nine inches longer than needed and cut as shown in the photograph. That part which came inside the header was allowed to extend below the floor line and was nailed to the joists. This was a means of providing a firm nailing base for the frame.

There is little possibility of this frame ever working loose as it is firmly held in the corner. Nails can be driven diagonally or perpendicular to either joint.

Framing for False-Beam Ceiling

118 The illustration at the bottom of the page shows the method of framing for a false beam ceiling, as built by a Florida contractor. Full details are shown and little explanation is necessary.

At first this method may seem complicated. It's worth a little study.

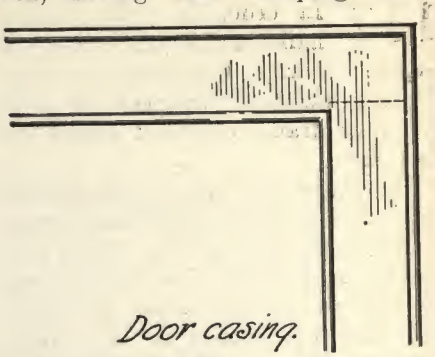
Finishing the Doorway Last

119 A. J., a builder of Boston, who was erecting several houses in Belmont, in order to prevent defacement of the building doorways simply let the trimming of the door openings go until the last part of the job.

When doorways are finished before the job they are quite easily damaged by workmen who are carrying in material and in some cases the entrances receive lasting disfigurements. This builder takes no chances. He cuts off the wall just at the opening, leaving alternate stretchers projecting to provide a good bond for patching the wall at the entrance when the time comes for this work.

About Doors

120 Recently in finishing a Colonial house using window and door casings with a back-band finish, J. H. M. had the mill make a ⅜-inch tenon on end of casing and mortise head to fill. It made a much better job, holding the wood even, saving time scraping down



Door casing.

joint and the end of casing is already cut. Using a little glue will make it still better.

It is a good plan to always cut casing and door jambs to length on a bench using an iron mitre-box. Gain the side jambs into head which makes jambs and casing same length. He used to make the heads on the job but being short of help on the last job, he had them made at the mill, which he thinks is better.

From an Old Time Stair Builder

121 Fifteen to twenty-five years ago it was the rule in one builder's town for contractors to hire professional stair builders to erect the stairways. Later it seemed as if the regular carpenter took over the stair builder's calling. Perhaps the contractors encouraged the change in the interest of economy, but it is a debatable question whether or not there has been a saving worthy of mention.

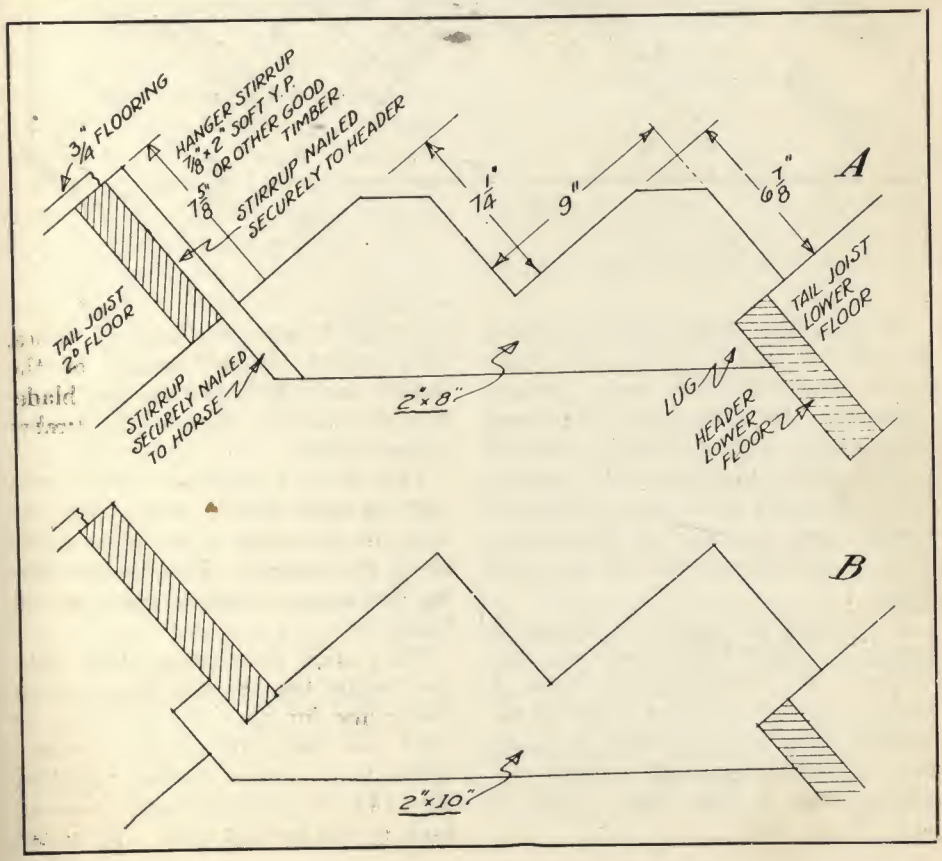
While the contributor has but little criticism to offer on the finished product as done by the carpenter, he has been vexed at the enormous

waste of lumber and labor because the carpenters have not utilized the tricks of the trade.

He feels safe in saying that not one in twenty of the regular carpenters cut their carriage or stair horses as they should be cut. Nor do they stop at the number needed to make a good job, but invariably add one more. Two horses are enough for any three-foot stairway and the usual dwelling has none wider than this.

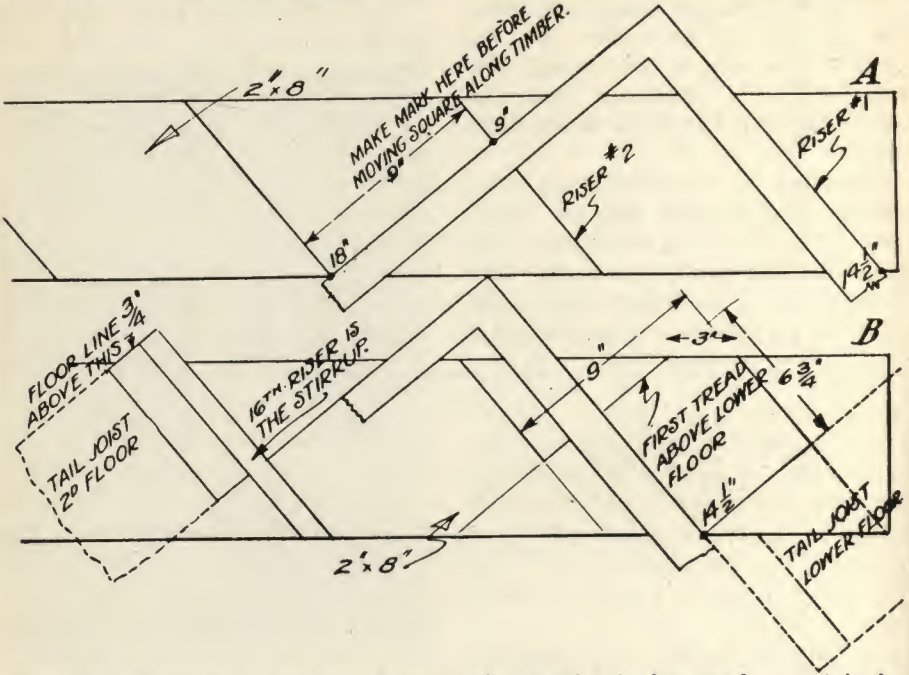
Referring to the sketch, (A) is as a professional stair builder would cut. (B) is as the carpenter cuts them (at least in this one city). (A) is cut out of a 2 x 8-inch, (B) is cut out of a 2 x 10-inch. Both are practically the same in strength. If (A) had been cut like (B) it would have been so weakened as to be almost worthless. Every crotch on (B) requires 16 inches of hand sawing, while (A) gets the same results with about 11 inches.

The writer went on to state that he noticed a double house had three horses to a side, cut to full point at outer angle of riser and tread kerf, all of them 2 by 10 inches by 18 feet, as it was a long stairs with an easy rise of approximately 6-inch and 11-inch tread. A horse cut from a 2 x 8-inch with a 3-inch frustrum would have been just as good in every respect and two to a side quite sufficient.



If it is an open stairs, cut but one horse and nail the triangles from first horse onto a 2 x 4-inch for the outside horse, which is supported by cripple studs anyway. Just a little sawing out in the angle of the crotch is all required on second horse.

Take your place at the bottom end and bottom edge of stick to be cut and with the end at your right. We will suppose 10-inch treads are to be used. This calls for a 9-inch tread cut. Doubling the 7¼-inch rise we have 14½ inches. Doubling



In the other figure he has shown an easy method of laying off a stair horse ready for the saw. Always double the rise and run. The usual 9-foot story with 2 x 8-inch joists in second floor measures 117 inches. With 16 risers of 7 inches each we would reach a height of 112 inches. This is 5 inches short of the next floor.

By making the risers 7½ inches we get up to 116-inch level, which is sufficient. By elevating the horse 1 inch at the top we have a dip of almostly exactly 1 1/16 inch to each tread which is regarded as more desirable than a dead level. Now to lay off the stick.

the tread 9 inches we have 18 inches, 14½ inches on the tongue of the square and 18 inches on the blade. Use the bottom edge of the timber as your guide.

(A) is a 2 x 8-inch. With 14½ and 18-inch marks even with the lower or near edge of the piece scribe along the tongue. Then before lifting the square make a mark on the blade.

Then slide the square along until the tongue touches the 9-inch mark and scribe for riser No. 2. Keep on until you have 16 scribes, vertical. When this is done timber will look like (A) in the drawing. Now go back to the bottom end. (B) is the

same stick drawn to avoid confusion of line. If your first riser scribe is near the end of the timber it will be necessary to make the first tread scribe from the top edge or else use the small numbers, 7¼ and 9, instead of 14½ and 18.

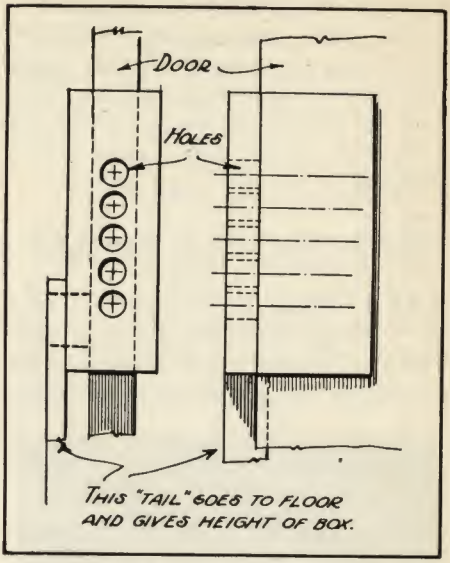
First measure up along the upper edge of the timber a distance of about 3 inches above where the first riser cuts the top edge of the stick. This is the point from which to project your first tread scribe. After the first tread scribe is projected use the numbers 14½ and 18, on tongue and blade as when laying off the risers. Then slide the square along until the 7¼ mark on the tongue touches the last tread scribe made, which was No. 1. Then make tread scribe No. 2.

Repeat until you have 15 tread scribes and you are ready for the saw, except the bottom riser, which must be cut off horizontally—with or without a "lug"—as one wishes, and must be about ⅜-inch lower than all other risers if set on the floor joists, and 1⅛-inch lower if set on top of floor. This is supposing you have ¾-inch flooring and 1⅛ treads.

The top riser should be cut off vertically and should always be hung with a stirrup made of stuff that will bear nailing securely to the horse and top floor header. It should be ⅛ x 2-inch, and be ⅜-inch greater rise than all other risers except the bottom one before mentioned. With a ¾-inch floor above, this makes all risers equal when stairs are finished.

Mortise for Lock in Narrow Door

122 From S. F. B. comes this handy short cut. By the use of this jig which is placed over a 1⅛-inch door stile in the position for mortise it is easily made by boring holes where indicated and then moving the jig up or down as needed



so as to get the new holes started. Drilling in these will complete the mortise. It is quite easy to operate as all one needs to do is just slip on the box, clamp it tight and go ahead.

Combination Closet and Stairway

123 In these days of high real estate values and increased building costs, it becomes necessary to make as much use as possible of every available inch of space inside the building. Closets are necessary and stairways to the attic are also necessary and where the two can be combined the space saved thereby may be considerable.

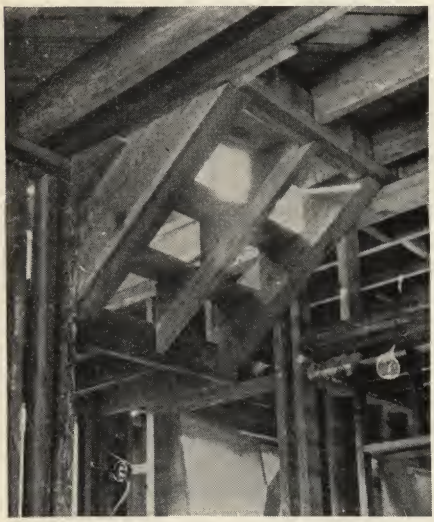
C. B. built this combination closet and stairway. It leads from the second floor to the space between the roof joists and ceiling joists. In order to provide as much closet room

as possible, only three treads were put in and since this stairway will be very seldom used the treads were built on very light stringers and constructed very lightly themselves.

When this part of the building is not in use as a stairway the treads may be used as storage shelves. This is an interesting method whereby one contractor saved floor space on a building.

Short Stairway Stringer

124 Here is a kink to save material and labor in stair framing. Where it is desired to set a middle stringer in a short stair-



way, it is not necessary to cut a joist for the center piece. Simply fit a 2 x 4″ in place and toe-nail to it the blocks cut from the end stringers as illustrated.

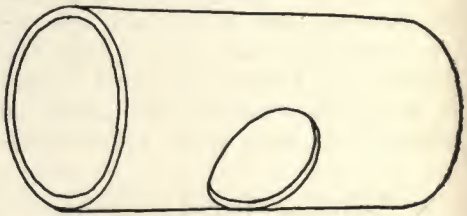
Winders Without Stringers

125 Every carpenter knows what a job it is to cut stair stringers and specially stringers for

winders. C. R. I. S., carpenter foreman for John Olsen of Des Moines, Iowa, frames short winders as shown in the accompanying illustration. Not only does this method save the labor involved in cutting a joist for a stringer, but also it is a means of using odds and ends of 2 x 4″s which would otherwise be wasted.

A Handy Tool

126 A. R. writes from California that he has a handy tool in the one shown. Take a piece of 1 inch steel tubing, 2½ inches long, and cut a round hole in one



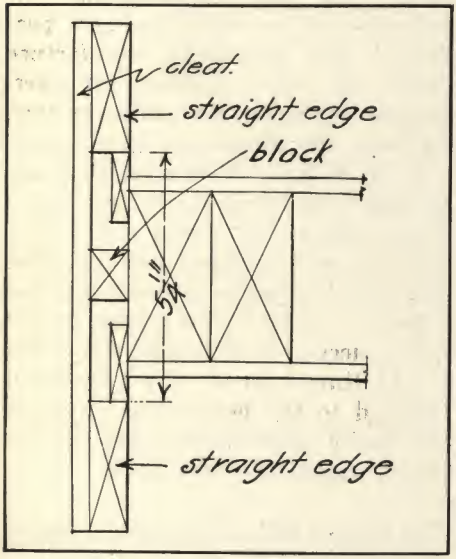
side. Then sharpen the edges. With his tool the carpenter can round the corners off handrails or casing.

New Use for Old Square

127 A. B. R. took an old square and cut it off at 3½ inches on the blade. He found it so useful in laying off studs that he wonders why the manufacturers of take-down squares do not make the short tongue on the 16-inch scale instead of the 24-inch. It is a scheme well worth considering.

Putting on Grounds for Doors

128 This method is suggested by H. H. S. who submits the sketch. Two-thirds of the labor can be eliminated by using a double straight edge when putting on grounds for door openings. For in-

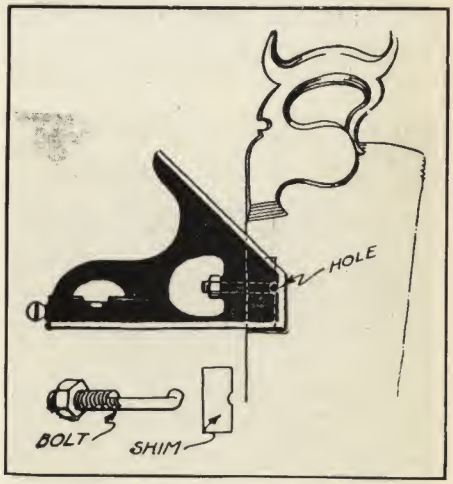


stance, take a 6 foot 8 inch door opening. Two straight edges, 6 feet, 8 inches long set apart 5¼ inches (or whatever the width of the jamb is). A 1-inch by 2-inch cleat nailed about 8 inches from each end will hold them together.

A block, nailed on center, between the two straight edges, holds the frame work away from the rough jambs enough to permit the grounds to be slipped in. The frame work should be plumbed in such a manner that it will provide for the proper thickness on both sides of the partition.

A Handy Combination

129 A. B. R. says that after a house is finished the owner very often wants an extra shelf or two. He does not like to take a tool box along so he takes only a plane,



a hammer and a saw fixed as shown. He punched a hole in the blade near the handle, then filed a bolt, ¼ x 1½-inch, with which to fasten the square on the saw. He has saw, square and level all in one tool.

Guide for Sawing Large Timbers

130 Cutting a heavy timber by hand is a hard job, as any one who has had to do it will tell you. Some carpenters not used to

this kind of work have trouble in making a straight cut and for those men, this idea may prove of some assistance.

When cutting a heavy timber, a small piece of scrap is tacked on the top of the piece to serve as a guide for the saw and to keep the cut in a straight line. This hint should be especially useful when a one-handed saw is used.

Base-Board Nailing Blocks in Brick Walls

131 Many contractors when setting nailing blocks for base-board in brick walls simply place the block in the wall and let it go at that. The result is that

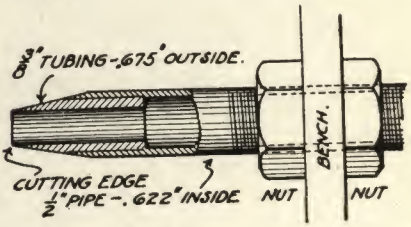
some blocks are loose and others tight and the contractor hopes that the odds are with the tight blocks.

The builder on whose job this photograph was taken, does not believe in trusting to luck to provide a firm fastening for his base-board. He uses a bit more labor than simply setting the blocks between the bricks. He cuts all the blocks to length and nails to them a thin horizontal strip which is set between bricks in the wall. A lath will do.

This horizontal strip is held at several points in the wall and is therefore set in the mason work quite firmly and any vertical piece fastened to it is also bound to be held tightly.

Making Dowel Pins

132 This carpenter has taken advantage of the inner and outer diameters of pipes. In the old days pipes were a great deal thicker

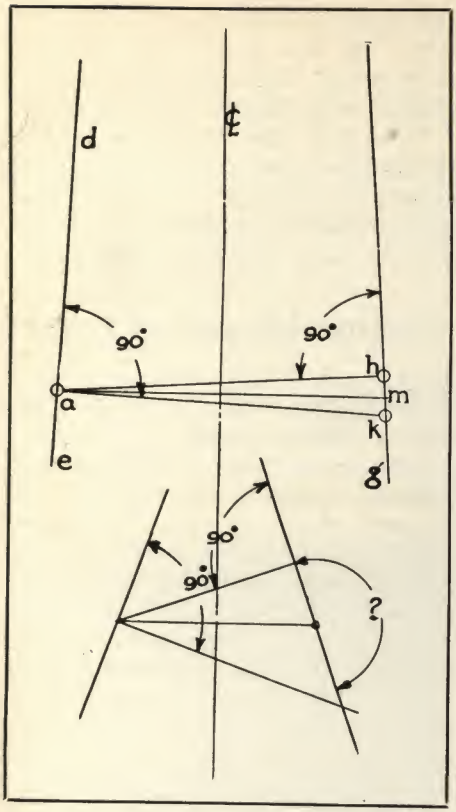


in the wall than now, and since the reduction of the wall thickness permitted by improved manufacture could not affect outside diameters without changing the entire system, we have the immediate case shown.

A. B. R. writes that some time ago he had work to do which required a large number of dowel pins. The mills charged so much per foot that he decided to make his own and had a piece of ⅜-inch steel tubing welded into a piece of ½-inch pipe which had a long thread on it. With this tool fastened to the bench, the carpenter can make pine dowel pins out of scraps which cost very little.

Cutting Off a Taper Column

133 F. B. proposes this method in cutting off a taper column. Take square on edge (d e), from point (a) where cut is to be made, and draw line (a k). Then, with the square on edge (f g), make another line (a h) from (a).

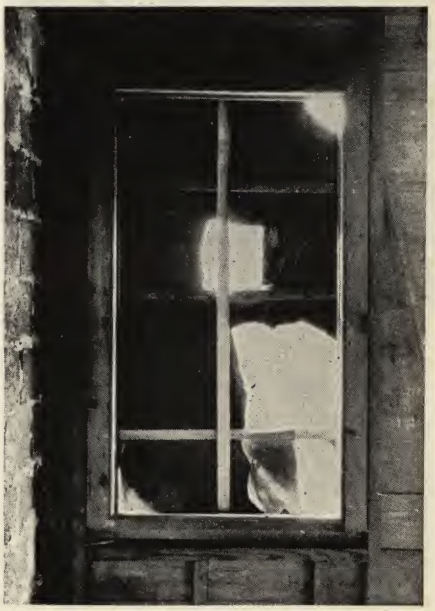


The line (a m), half way between these two is the required square line. Continue this operation around the post and you have it square with the axis of the post.

Temporary Blocking for Wall Openings

134 When the time comes for plastering a new building, there is usually a period of doubt as to just what method should be used for closing the building in so that damage from blowing rains, dust storms, low temperatures and the numerous other sources of damage to a freshly plastered wall is avoided.

To hang the sash at this time is seldom satisfactory, because of the consequent damage by breakage and mortar dropping; it is expensive to block wall openings temporarily with boards and it is unsatisfactory to stretch paper across the opening, for the paper soon breaks or tears. If a few 1 x 2″ strips are nailed across the opening as shown in the illustration, the paper will last much longer than if it is just tacked at the



frame without any intermediate support. The few pieces of 1 x 2″ nailed across the opening prevent the paper from blowing inward and breaking under the force of the wind.

Nailing a Tin Siding Corner

135 On small inexpensive houses where siding is used for the exterior walls, tin corners are sometimes set, as a means of reducing the labor costs of mitering the siding at the corners.

This contractor attaches these tin corners in the manner shown. He nails the siding to the wall driving the nails full depth except at the corners. At the corners the siding is only tacked, the nails being left extended as shown in the illustration.

When the time comes for placing the metal corners the nails are withdrawn, the corners set in place and bent around the edges of the siding and the nails are driven tight.

Cutting Sheathing Paper

136 A handy way of getting the strips of paper for putting under casing of window frames is to take a full roll of builders' paper, and measuring off one end of the roll the width you intend to make the strip, saw through the roll, and thereby obtain a strip of paper the right width which is convenient to carry around from window to window and easy to use.

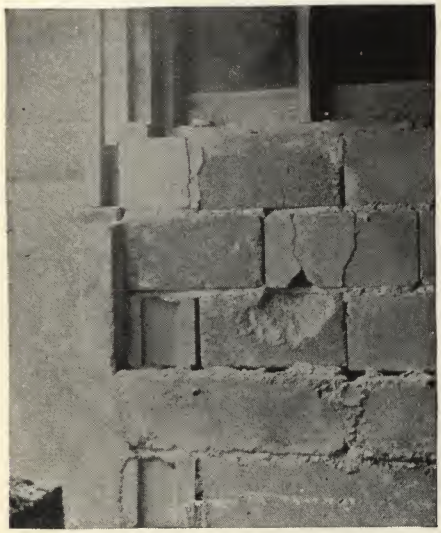
CHAPTER VII

Short Cuts in Masonry and Brickwork

THE man with the trowel receives good wages therefore it is necessary to save his time wherever possible. Knowing how to do a job more competently and more quickly will save time and material; here is a fine collection of short cuts in laying up stone and brick work that will help save time on difficult problems.

Why Walls Settle

137 Poor workmanship may ruin good materials and nullify the best intentions. The view herewith is an example, where one of the best building materials



may receive a black-eye from crude and indifferent handling. From the header-blocks shown it may readily be seen that this portion of the foundation is at the corner of the building, a part that should be strongest but which in this case is far from having the required strength. The cracked block at the top and the chipped block below do anything but increase the strength of the foundation.

Concrete blocks make very good foundations for certain types of buildings and their use is to be encouraged but such construction as is shown here is bound to make the owner dissatisfied with a block foundation, even if it does not result in actual damage.

No contractor should attempt to "get by" with any such thing as the foundation shown above. It is such deeds as this that give the whole contracting business a bad name.

Ornamental Joints in Rough Masonry Walls

138 In regions where stone abounds, this material is often used for building up walls of houses. It makes as good and solid a wall as any other type of masonry and where it may be had close to the building site it probably works out cheaper in cost than any other material.

In the East many of the newer buildings, especially around Philadelphia and Germantown, Pennsylvania, are built of stone. Sometimes the joints are left rough, as shown in the illustration, occasionally they are slightly raked out, and often they are finished as shown, the effect being a series of white lines which tend to make the joints sharp and distinct instead of indistinct.

Fisher and Miller, builders of Philadelphia, Pa., secure this white line effect in the following manner. The wall is laid up without any attempt at finishing the joints and is so left until the entire roughing-in of the building has been completed. Then the joints are completely filled with gray cement and pointed so that the cement in the joints comes fairly flush with the face of the wall.

While the gray cement is still fresh, a thin coating of white cement (about ⅛ inch to ¼ inch thick) is smeared over the joint and allowed to stand over night. The next morning the ragged edges of the white lines, formed by laying on the white cement, may be trimmed with a pointing trowel and the effect shown here secured.

It is important that the pointing with gray cement and the application of the white cement be done on small areas of the wall instead of attempting to point the entire wall first and then apply the white cement to the joint. This is because it is absolutely necessary that the white cement be applied while the under coat of gray cement is still fresh so that a good bond between the two may be secured. If the two cements are not well bonded the white cement will not adhere to the wall and will, in time, drop off.

Use for Cobbles

139 Cobblestones that were formerly used in paving the streets of San Francisco have been used in the construction of the gateman's office and the gateway at the San Francisco County Relief

Home. There are two large columns, one on each side of the entrance. Extending from the columns the top of the wall is finished in scroll work, giving a very pleasing appearance and costing very little for material.

Formwork for a Stone Pier

140 This method of building a stone pier is used around Chattanooga, Tenn., where rough stone is quite an important decorative feature of many small houses.

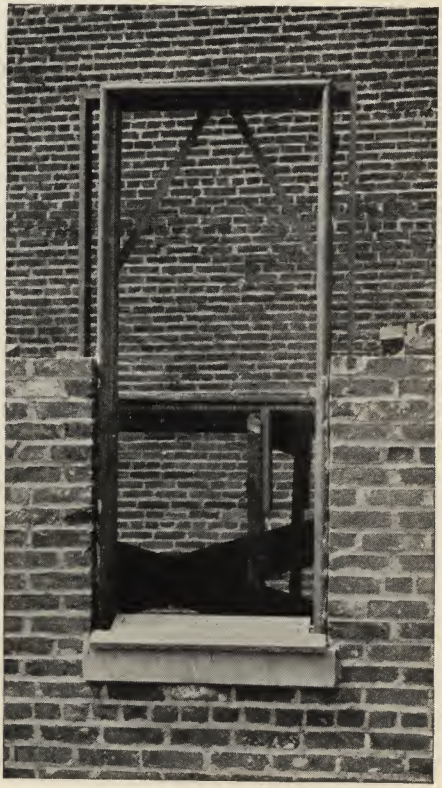
It consists of nothing more or less than a strip at the four corners, held together by a few laths which are nailed on for stiffness as the work progresses.

The stones are laid between the guides and a good looking job is generally the result. Battered piers may be built by nailing a shorter strip at the top of the guide poles than is nailed at the bottom, this producing the desired taper.

Note by the layout of the materials on the scaffold how the work is carried on. One hand is used in laying the mortar, and the other in placing the stone.

Protect Your Cut Stone

141 Unfortunately, few contractors take the trouble to provide protection for exterior trim, with the result that many times the appearance of a building is marred by an ugly break where a falling brick has knocked a chip off the stonework. It requires very little



trouble to prevent such disfigurement and, without question, the few cents spent in covering ornamental stone will bring big returns to the contractor in adding to his reputation as a careful builder.

When covering cut stone sills H. B. simply tacks a board to the window frame. This board will prevent falling brick or debris from chipping the stone work and causing unsightly marks. It is left in place until the work is done and is removed by the pointers who do the cleaning up.

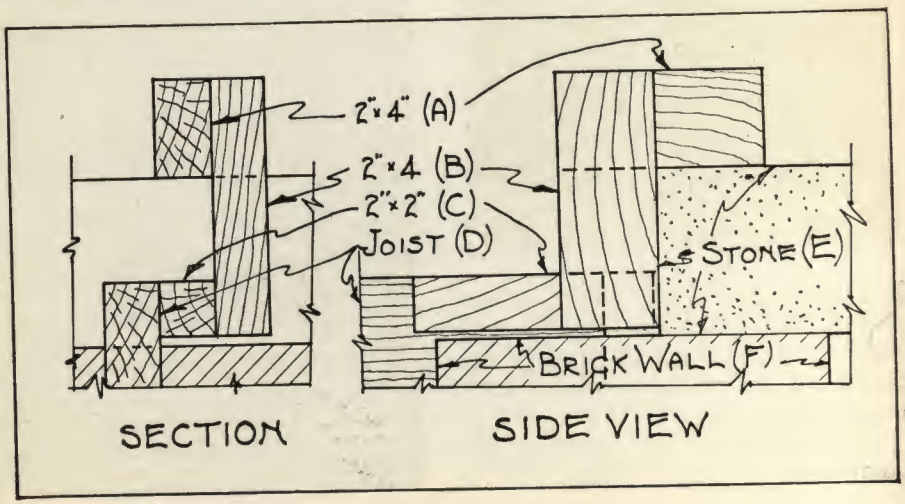
This board costs practically nothing and the time required to fit it into place is hardly worth considering.

Holding Stone Trim in Place

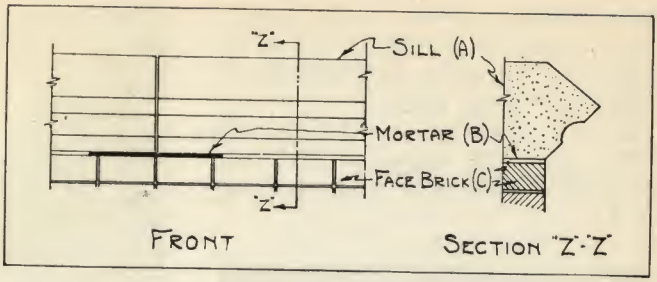
142 In many instances it becomes exceedingly difficult to set stone trim because of the manner in which the trim is to be placed. This is especially true if the trim is to be projected beyond the face of the wall. When the wall above the trim is in place there is no question about the piece being firmly held but some method must be devised to hold the piece until the wall is built over it.

The method shown here will be found to be perfectly satisfactory, and it involves the use of only a few pieces of scrap and a few moments' time. It consists of holding the piece by means of a clamp as illustrated in the sketch.

In case the joist (D) does not extend far enough so that the 2 x 4″ (B) can be nailed to it, a piece of



2 x 2″ (C) may be used as an extension. Then a piece of 1 x 4″ or 2 x 4″ is nailed to the 2 x 2″ (C) and to this another piece of 1 x 4″ or 2 x 4″ (A).



It will be readily seen that this clamp will hold the stone and prevent it from tipping even though it projects beyond the face of the wall. With these clamps in place (one at each end of the piece), the wall may be carried up between them and when sufficient brickwork is in place so that its weight will hold the piece, the clamps may be removed.

Setting Stone Sills

143 There are two possible ways of setting stone sills. One is to set the sill in a full bed of mortar spread over the entire surface, and the other is to set it with

mortar placed only at the ends. A short investigation will show the advantages of the former.

If, as shown in the sketch, the sill (A) is placed with mortar (B) only at the ends, it will be found quite easy to level the sill (A) and to set it in place but there is a small possibility of the sill being cracked if any great load is brought to bear upon it. On the other hand, if the sill (A) is bedded over the entire surface of the brick (C) for its whole length, there will be no possibility of cracking the sill but it will be a stiff job to set it in place.

After the sill has been leveled and the mortar allowed to harden that part of the sill under which there is no mortar should be pointed lest a heavy weight resting on it will cause it to crack.

Protection for Cut Stone Trim

144 Where cut stone trim is used at corners, it is very necessary that it be protected, while the building is under construction, against chipping or rubbing, for it takes only a slight blow to break the corner from a piece of ornamental cut stone. Two boards, placed as shown in the photograph, serve the purpose of protecting the corners very well, but in ordinary circumstances the means of holding these boards in place presents quite a problem, since there is nothing they may be fastened to except brick or stone.

A firm of builders use the method shown here for holding these corner pieces in place. Two wood wedges

are driven as shown in the illustration, and a bit of wire run from one wedge to the other, thus holding the wood protecting pieces and preventing them from falling. A few nails driven into the edges of the wood pieces will aid their strength materially.

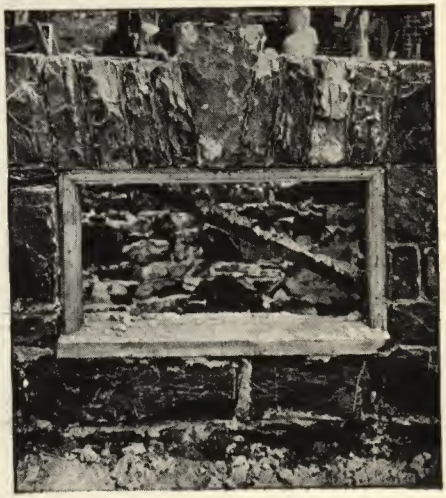
Lintel for Stone Wall Construction

145 For the contractor who builds only with brick or lumber, the construction of a stone wall house might offer some serious problems. It is a form of wall construction entirely different from any other kind.

Stone walls are usually made 18

inches thick because of the difficulty encountered in setting the odd sized pieces to form a plumb wall. Random stone can not be corbeled and the weight to be supported over an opening is equal to the weight of the entire stone wall above the opening instead of the weight of the corbel triangle above the opening as in a brick wall.

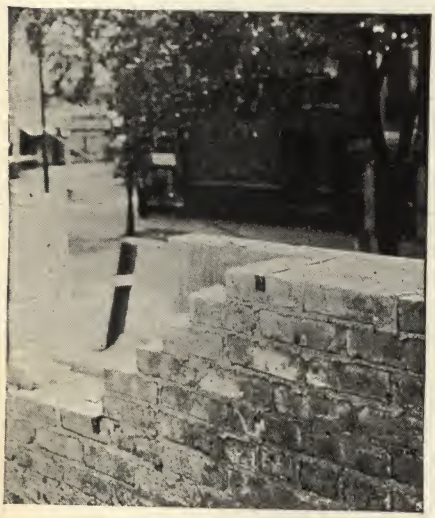
To support this heavy weight over a window frame, a rough stone arch is built over the opening on the outside of the wall as shown. This arch takes part of the load and also forms an ornamental detail for the exterior wall. On the inside of the wall a heavy lintel is set over the opening.



The lintel is built up of three 2 x 12″ joists, separated from each other by short pieces of 2 x 4″s, so that the three joists cover the width of the wall behind the arch and form a base upon which to lay stone over the opening. This lintel should have a bearing of at least 12 inches on each side of the opening and should be set up above the window frame high enough so that it will not touch it.

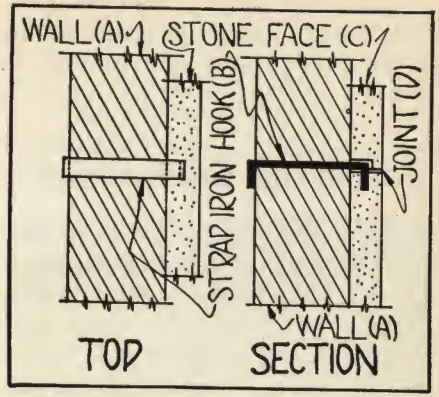
Holding Stone Facing to Brick Wall

146 Where buildings are veneered with stone instead of having the walls solidly built of



that material, the walls are generally built of brick, and some facing to the brick wall. This may be simply and efficiently done as illustrated in the accompanying sketch and photograph.

The stone facing (C) here shown held to the wall by a strap-iron hook (B), which is set in a hole cut for the purpose in the stone, and, at the wall,



bent over the brick, thus holding the wall and facing together. Where it is necessary to make thin joints (D) the bottom of the stone may be cut out on the inside to make room for the hook. These hooks may be made in any blacksmith shop and should be about 1½″ wide and ⅛″ thick.

Where the walls are exceedingly thick the inside hook may be set in the wall instead of running clear back to the face of the wall, thus making it unnecessary to provide extra-length hooks. Good practice demands, however, that the hook be set in the wall at least 12 inches.

Pipes in a Stone Wall

147 A criticism is always more welcome when accompanied by a suggestion. Regarding the practice of leaving an opening in a stone wall for pipes and then filling in with stones and mortar after the pipes are set, W. M. suggests a better method.

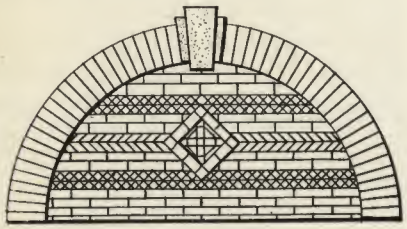
He sets a pipe that is as long as the thickness of the wall and about 2 inches bigger than the outside dimension of the pipe that goes through the wall.

After the pipes are set the space around the pipe is filled with water-

proof packing which will give if the wall settles a little. If the pipes are solidly bedded they are liable to be broken.

Building Brick Panel

148 Modern brickwork is often subject to the designing of fancy and intricate panels, "bull's-eyes," etc. These are built with various shaped brick and as a rule are very costly. To keep the cost down A. T. N. experimented by building them on the ground and the results were very gratifying.



A school house job called for a semi-circular panel over each of the four entrances. They were 10 feet in width, which of course made them 5 feet high. The builder had a platform constructed out of sheathing on 2 x 4″ sleepers, the surface of which was absolutely true. On this he drew design of panel "life size," showing every brick and every joint. Starting at the bottom the bricks were laid face downward until panel was complete.

The joints were filled with sand to the depth of ½″ width with the exception of the joints which divided panel into 5 sections as shown in the sketch. These were filled solid with sand. (Soft brick should be wet.) Then he filled balance of joints with grout about the consistency of thick cream made of 1 part cement to 2½ parts of sand. He plastered the entire back of panel with ⅜″ coat of mortar (cement).

Two men handled any one of these sections. They were allowed to set 36 hrs. and not one piece of brick came loose. After setting in place in wall sand was washed out and joints pointed with face mortar.

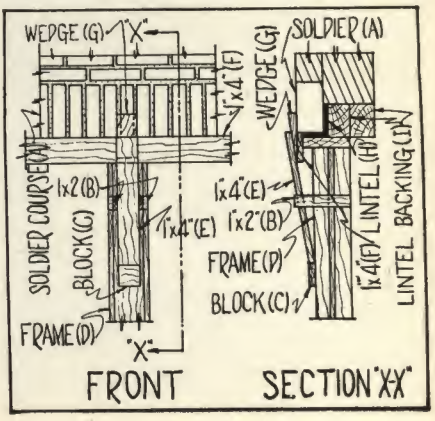
No mason—no matter how skillful—can build these panels, bull's eyes, etc., as nearly perfect as when made in this way, nor for the same money.

Keeping Soldier Courses Straight

149 There are any number of decorative effects which may be produced by the arrangement of bricks in the face of a wall. Not all of them are intricate in pattern and difficult to achieve; in fact, some of the most simple are the most effective.

A common type of ornamentation is to provide belt courses of brick set on edge, or "soldier courses." A soldier course, when properly laid, does much to add to the appearance of a wall, but when improperly laid it will mar an otherwise fine piece of work.

The difficulty most frequently encountered in laying soldier courses



is to have the bricks vertical and the bottom edges of the bricks in a straight line.

The method shown here for accomplishing these desired ends should not only provide a better looking wall than is ordinarily erected, but also should result in a saving of the bricklayer's time, since it will not be necessary for him to use as much care in laying the bricks.

The brace proper consists of a piece of 1 x 4″ (E) running from the frame (D) to the soldier course (A). At the top of the brace (E) a piece of 1 x 4″ (F) is nailed. This piece of 1 x 4″ (F) is the guide for laying the soldier course (A). If its upper edge is straight the bricks may be laid up to it, thus bringing them the proper distance out from the wall and holding their lower-edges in a straight line.

A wedge (G) should be set between the 1 x 4″ (E) and the 1 x 4″ (F) so that the guide (F) will be vertical. Two pieces of 1 x 2″ (B) are nailed to the frame (D) and to the 1 x 4″ (E) to keep the 1 x 4″ (E) from tipping outward from the wall, and a block (C) is used to prevent it from sliding down.

Soldier Course Corners

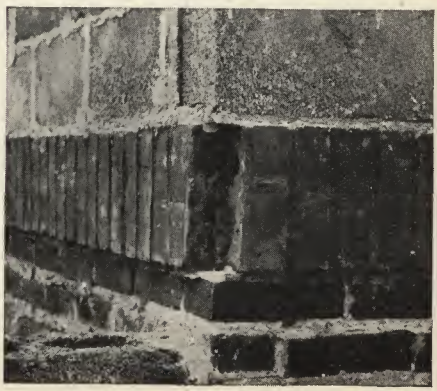
150 Soldier courses, or courses of brick on end, are often used as belt courses in wall ornamentation. Where the soldiers are allowed to run clear around the building, the corners should be handled as shown in the illustration here.

Instead of allowing the soldier course go clear around the corner, it is stopped just short of the corner and the header and stretcher arrangement built up as shown. This makes a good strong corner and detracts little, if anything, from the general ornamental scheme.

If the soldiers are allowed to continue clear around the building it becomes necessary to set a brick on end

at the building corner. When this is done there is always the danger that the thing shown in the illustration might occur. Here a vertical brick has been knocked from the corner by a plank, carried by a passing laborer. The danger that the brick may be knocked out is not near as serious as what might have happened if the soldier course were at the top of a building and the brick had fallen out.

As will be readily noted from the illustration, a brick set on end has



very little bearing at its base, especially if it be projected, and consequently very little mortar acts to bond it in place as compared with the brick laid, as shown in the first illustration.

Where brick are laid flat they have a considerably firmer base and a larger area of base on which the mortar acts to bond the brick to the wall. A comparison of the areas of the end of a brick and the face will illustrate this point.

Corners of Soldier Courses

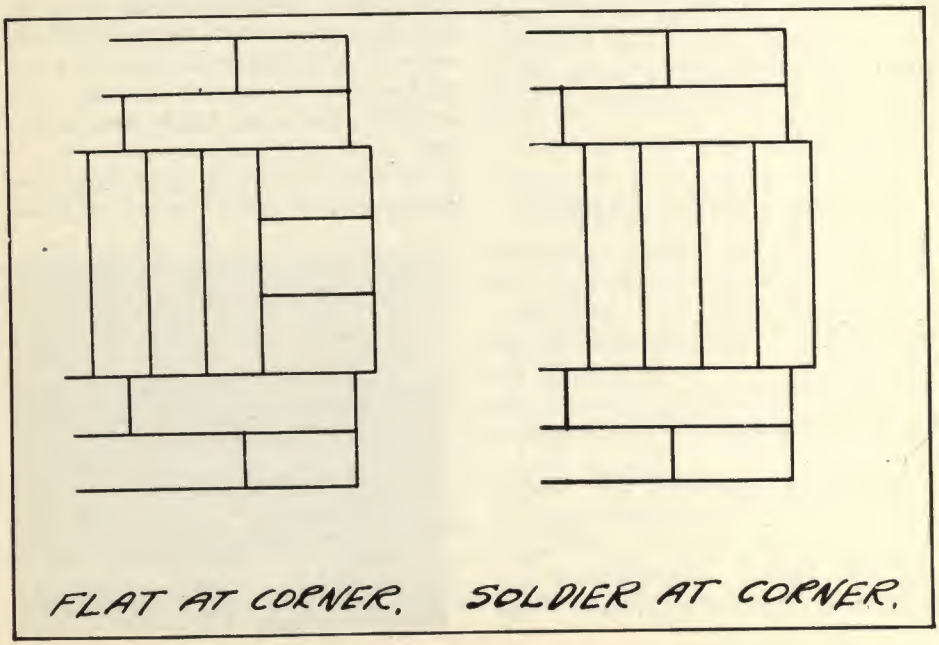
151 When a soldier course runs to a corner it is always advisable to place three half-brick lying flat as shown instead of a single brick at the corner. A brick on edge at the corner makes for very weak construction and may cause some damage in case it should fall out.

There is little mortar surface in the corner brick of a soldier course and the same base of a brick on edge does not provide sufficient stability, especially if the soldier course be projecting.

If the three half-brick be used, a firm base is assured as well as a greater mortar surface, and the corner is not apt to be knocked out, as often happens when a single brick is used. The three half-brick do not at all detract from the appearance of a face-brick wall.

Bracing for Brick Pier

152 It is unwise to leave a freshly laid brick pier of any great height without support lest a strong wind blow it down. How to arrange the support in a simple and economical manner is well-illustrated in the accompanying view, which shows a scheme used by R. F. McClure, superintendent of construction for Chambers & Son of Chattanooga, Tenn.



Two pieces of 1 x 6″ are nailed to stakes and sloped to the pier. Then another piece of 1 x 6″, cut to a length equal to the width of the pier, is placed against the front of the pier and nailed between the two diagonal braces. A third piece is nailed at the rear the same as the piece in front. This system of bracing will be strong enough to take care of all ordinary forces which might tend to overturn the pier.

Brick Sills for Basement Windows

153 A contractor of Utica, N. Y., has a way of handling brick basement sills that may appeal to brother contractors in other parts of the country.

In setting the brick sill, the mason chips each brick so that a triangle is cut off at the end and then lays the brick on the foundation long side down. Cement mortar is then used to cover the inside of the sill and to fill the opening between the window frame and the top of the sill in order to make a good tight job.

The cement is carried over the brick and on to the exposed foundation to finish the inside of the sill off smooth and to prevent dust and dirt from accumulating in the crevices.

Fire Stops for Brick Buildings

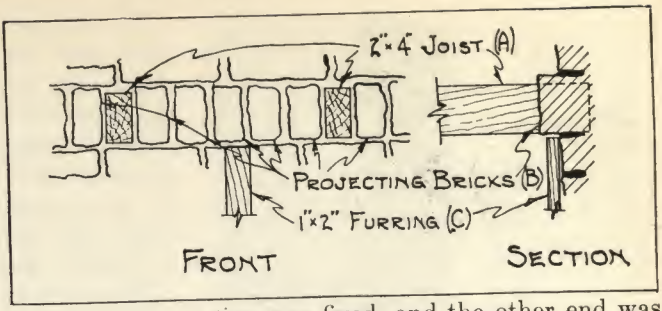
154 One of the great hazards to our modern cities is fire. Builders, while they are erecting a building, can do their share of cutting down this hazard by providing adequate stops against the passage of fire from room to room or from story to story.

In brick buildings, where the walls are furred for plaster, there is always the possibility of fire creeping up from story to story in the space between the brick wall and the plaster. This space between two pieces of furring is really a flue which aids the passage of flame and smoke, and it is therefore desirable that the draft in this flue be stopped.

This is best accomplished in brick buildings by the method illustrated in the accompanying sketch. The course of bricks marked (B) at the line where the ceiling joists (A) or the joists for the floor above set on the wall are projected out from the wall so that they close the space between the furring (C) and the wall.

If fire should by any chance creep

between the furring (C) and the wall, it would be confined to a single floor, since the passage of fire to the next floor would be cut off by the projecting rowlock course (B) as shown.



A Battered Chimney

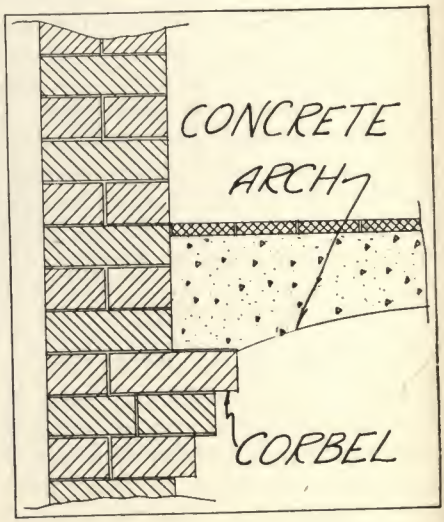
155 Battered walls of any kind are always hard to build. They mean considerable time lost by the bricklayer in getting the required offsets in order to give the correct slope to the corners. Sometimes, however, it is possible to locate the slope by means of mason's line, as shown in the accompanying illustration.

In order to set these lines, two horizontal pieces of 1 x 6″ were nailed across the rafters, close to the ridge. Two projecting pieces of 2 x 2″ were nailed to these 1 x 6″s to form the top point to which one end of the line was fixed, and the other end was tied to a nail set into the mortar joints where the batter started.

This made the work easy for the bricklayer. All he had to do was to lay his brick at the corner to the cord, set his level to test the face of the wall, and the job was done.

Concrete Arch for Chimney Hearth

156 It is customary to build brick arches, as is common practice, to support the fireplace hearth, but E. W. W. builds them of concrete in the manner shown in figure below. In order to provide sufficient bearing for the concrete slab which forms the hearth base,



the foundation brick are corbeled out in the manner shown until at least 4 inches of bearing is obtained. The formwork is then built and the slab poured.

Where the slab meets the joist it may be held by a supporting cleat and a few long bolts, fastened into the joist and extending into the slab. The ends which extend into the slab should be bent into a hook shape.

After the concrete sets the forms may be removed, but the arrangement will be more solid if they are left in place, as is done with the centering for brick arch hearths. If the forms are left in place they should be solidly built and wedged.

An Aid to Building Rubble Bays

157 Some masons find trouble in building bays in rubble foundations. A contractor of New Haven provides his masons with a frame guide as shown in the illustration. This guide not only aids the men in laying up the wall but also it does away with the necessity for providing chalk line guides at the bay.

At first thought this does not sound like much of an idea, but anyone familiar with laying rubble foundations will readily understand the added ease afforded by such a form as this over the old method of working with chalkline guides.

For one thing, the chalkline must be taken down at the end of one day's work and set up again at the beginning of the next. This may not seem much labor, but the next time

you lay out a chalk line for an interrupted wall, see how long it takes you to do it.

A Trim Brick Sill

158 It is sometimes difficult to get a straight horizontal line in a brick sill but if a short cleat

is nailed directly under the sill and the bricks laid upon this cleat, they are bound to be set true.

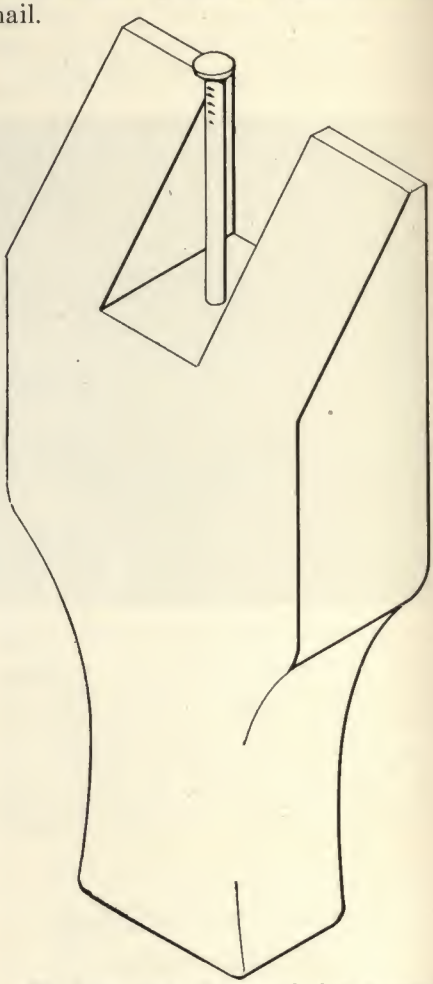
This method is a simple one but an exceedingly effective one, too.

Black Mortar Color

159 G. A. D. offers the following information. Many mason contractors claim that they are unable to get black mortar that will hold its color. G. A. D. suggests that they use a liberal amount of dark green pigment in the mix. This has been quite satisfactory in old work. Another contractor uses oxide of manganese, mixed one pint to one bag of cement.

A Joint Raker

160 Referring to the illustration, C. R. D. offers this "kink." Secure a block of wood $\frac{7}{8} \times 3 \times 8''$, soft wood preferred. Shape one end to fit the hand. Cut a notch 1 inch square in the other end, and then cut this end on a bevel as shown. Drive an 8d nail in the center of the notch and let the nail stand out to conform to the depth of the joint required. When the nail becomes worn remove, drive in a small wooden plug and place another nail.

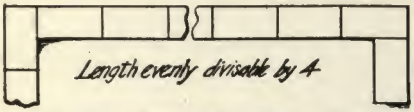


He has used this tool for several years and finds it a very simple and effective raker. It cleans the joints nicely.

The function of the nail is to cut the mortar while the teeth on either side of nail scrape it out of joint.

For Laying Cement and Tile Block

161 Here is a hint for bricklayers and masons to apply when laying 8 x 8 x 16″ tile and cement blocks. The majority of the

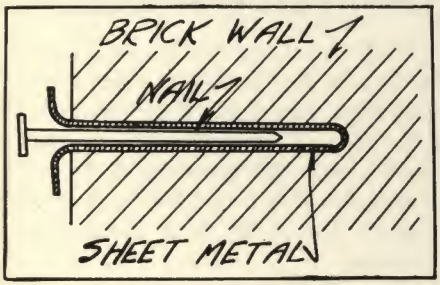


cell walls run 24 x 24″, 24 x 26″, 24 x 28″, etc.; when starting your corners first consider your closers. This is a method of eliminating the latter. Divide 4 into the length, and if it comes even, turn corners opposite; when 4 does not divide even into the length, turn corners the same.

Holding Casing to a Brick Wall

162 The ordinary method of holding any piece of wood trim to a brick wall is to set wood blocks called jamb blocks, in the wall while it is going up and nailing the wood trim directly to the blocks.

J. H. T., a contractor of Little Rock, Ark., has another idea for this



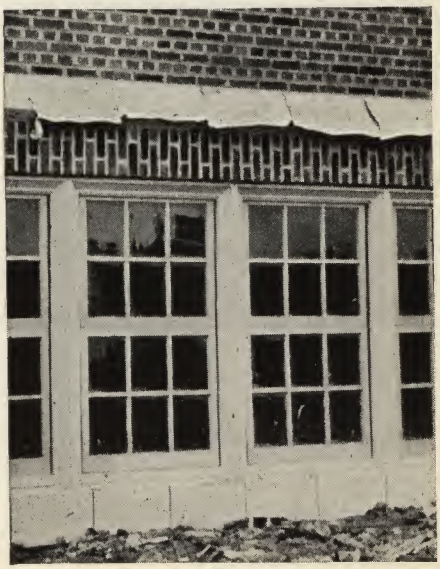
kind of job, which is very interesting. Instead of building jamb blocks into the wall he sets a piece of sheet metal into the brick joint with lips extended, as shown above.

When it is time to set the trim in place the nails are driven between the lips of the piece of sheet metal in the joint. The weight of the brick above the sheet metal will be sufficient to hold the nails in place once they are driven, and little difficulty will be encountered in driving them. An ordinary hammer blow is sufficient.

The principle is about the same as driving piles in soil. These sheet metal strips have a decided advantage over wood blocks. If they are cut from a piece of metal which is not likely to corrode, their permanence is assured, and there is no danger of the nails loosening as is the case when a wood block rots out.

Inexpensive Way to Protect Exterior Trim

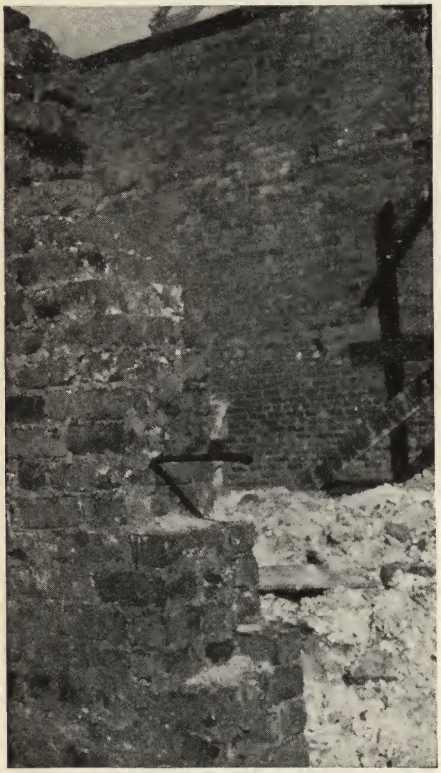
163 A cheap and easy way of keeping mortar dripping off terra cotta or cut stone exterior trim is shown here. This contractor simply uses the old paper bags in which cement was delivered and sets them



directly into the wall to hold them in place. The accumulation of mortar drippings soon becomes heavy enough to prevent the paper from flapping in the wind.

Method of Bonding Terra Cotta Facing to Brick Wall

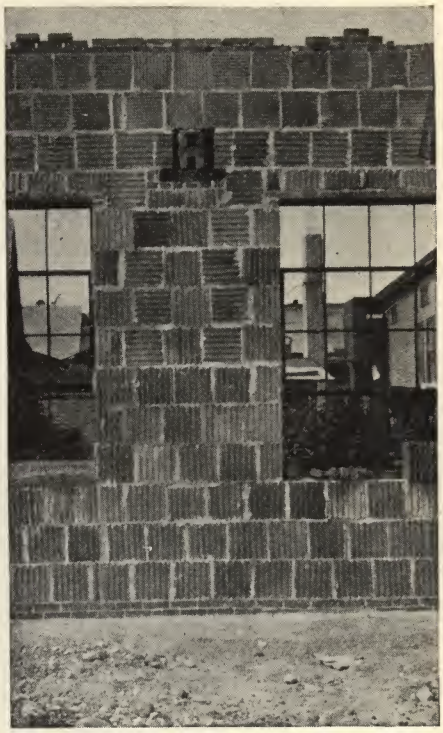
164 Here is shown an aid to holding terra cotta facing to brick walls. Walls may be run up before the terra cotta is delivered on the job, if a few pieces of ½-inch round iron bent to a hook are set in



the wall, as shown. These provide a good bond and they are an excellent aid in pushing work which might be otherwise delayed.

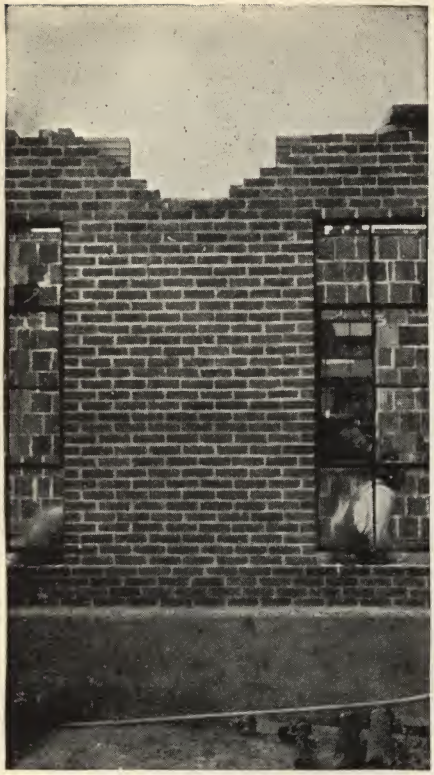
Providing for Future Erection of Steel Trusses

165 Sometimes jobs are held up for lack of material, with a consequent loss to both the contractor and owner. It may be worth



a little extra expense if provision can be made for installing the delayed material, provided the job can be kept going. In the two photographs shown here we see how a Vermont contractor kept the job going even though the steel roof trusses were missing.

The wall was built up to the level of the trusses on both sides of the building. Work was then stopped on one wall but the other wall was continued for quite a distance upward, space being allowed as shown for setting the trusses when they arrived.



The trusses will be erected in the following manner when they come on the job: They will be set diagonally across the building and hoisted to the proper level with a derrick. Then the one end of the truss will be set into the wall, where provision has been made for it, and the other end will be set on top of the opposite wall at the proper level. Only one wall could be built up since provision had to be made for swinging the truss in place. For this reason it is best to work on one wall only.

Holding Door Frames

166 The stunt shown here used by a South Bend, Ind., contractor, to hold door frames while building up the wall, seems to be a

pretty good one. It requires only a few cleats nailed to the bottom of the frame as shown and nailed to the rough floor. The cleats will hold the frame firmly at the base while the diagonal supports may be depended upon to hold them at top.

CHAPTER VIII

Short Cuts in Cement and Concrete Work

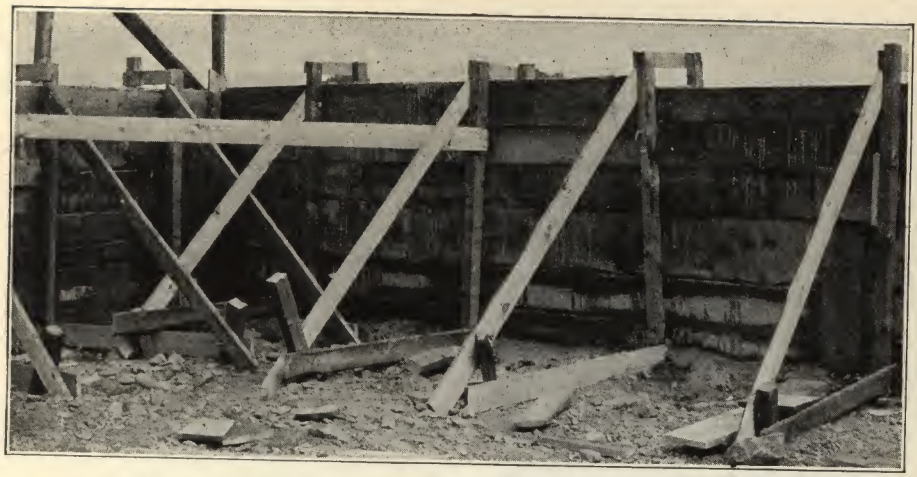
THE great strides in building construction during the last 25 years is due in a large measure to the use of Portland cement. Through its use many economical improvements in building construction have been made possible. Here are a number of excellent short cuts in the use of cement for concrete work, both plain and reinforced, also stucco work. To round out the subject we have included in addition, a few short cuts applicable to plasterers' work.

Foundations for Small Buildings

167 We hear considerable these days about efficiency in concrete construction, modern methods, labor saving construction, labor saving devices, and other phrases descriptive of advances in the building industry.

Upon investigation, however, we generally find that the job under discussion is a big one where complicated machinery is employed and hundreds of men are at work. Somehow or other the small job has been neglected and considered as something to be left to get along as best it might in the old fashioned way.

However, for every big job there are a hundred or more smaller ones and if as much time and trouble



were taken to improve the methods employed in putting up small buildings as is spent on the erection of large ones the saving on the hundred smaller jobs would undoubtedly be far greater than that on the one large job.

A. A. Turner, a contractor of Portland, Me., who specializes in foundation work for small buildings, is a firm believer in the above doctrine and it will readily be seen by the illustrations shown here that he has put considerable time and study into the business of building concrete foundations.

The job described here was considered too small for the use of a mixer and therefore all concrete used was mixed by hand. As considerable heavy field stone was to be had adjacent to the site of the building this stone was used in the foundation together with the regular small sized aggregate.

Concrete of standard proportion was mixed by hand in a mixing box and poured directly from the box into the forms. Due to the fact that a considerable amount of heavy field stone was used, the gravel for the concrete was selected a little finer than ordinarily.

It is interesting to note the construction of the mixing box and the method of using it. First of all, it is shallow, and therefore the mixing is easy; second, it is light and therefore easily moved about; and third, it is set upon horses so that the men mixing the concrete are not required to work with their backs bent. This, as anyone who has mixed concrete by hand knows only too well, is a decided improvement over the old method of mixing on the grade level. It is child's work by contrast.

The method of procedure in building a foundation is a logical one, each step following the other in an orderly procession. After the footings are laid the forms are set up, and then fresh concrete is dumped into the forms to about a one-foot thickness. Upon this "cushion" of concrete the heavy stone which has previously been placed around the forms, is dumped in, another layer of concrete is poured over the stones and then another layer of stones is dumped in.

Since the gravel used in the concrete is finer than is ordinarily used the mixture will flow around the

heavy stones and fill up the crevices, bonding the stones tightly to make a solid masonry wall.

This method is particularly suited to small structures without basements.

The Prevention of Pressure from Warped Wooden Forms

168 H. S. is concerned with the swelling of the horizontal forms, or the end thrust against the wall. To prevent the swelling of the wood forms from pushing out the outside walls of a brick building with reinforced concrete floors, while it is being erected, is an easy matter. The wood forms should always be kept about ¾-inch from the wall, whenever there is a large amount of floor space. This opening should be covered with either rubberoid roofing or tin.

Many carpenters allow for the swelling of the wood but do not cover the opening to prevent the concrete from filling it up. When this space is not kept open the situation is just as bad as when the forms are placed tight against the walls, inasmuch as the concrete will have set enough so that it will not give, by the time the forms have absorbed enough moisture to make the swelling of the wood forms push against the walls.

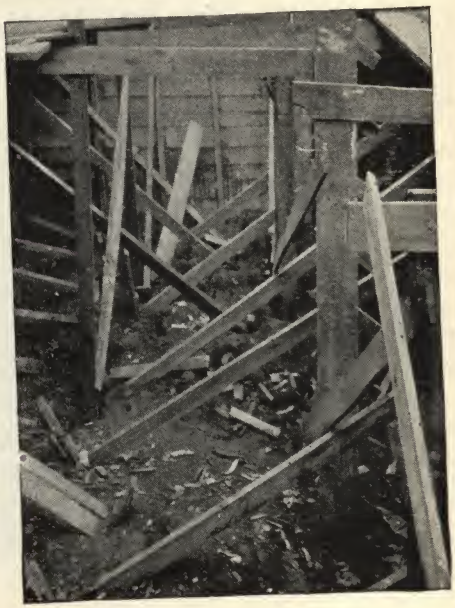
Some mechanics even have the mistaken notion that the pressure of the concrete before it has set causes the wall to go out. The fact of the matter is, of course, that the swelling of the forms forces the walls out.

Are there any who can give definite information as to side thrust occasioned by fresh poured concrete?

The other figure is submitted by M. L., who desires to know if he is simply out of luck. A crack developed in a foundation wall of one of his houses sometime during the summer. The house was built early in the fall of the previous year. The buyer insisted that the crack comes from poor footings, while he insisted that the window being left open all summer left an unpainted sill warp. The piece may have been a little too long and he thinks that was the sole cause. It is problematical.

To Brace Foundation Forms

169 Many concrete contractors have been troubled with loose formwork after the whole form has been set in place and braced. As a means of overcoming this difficulty a builder of Knoxville, Tenn., hit upon the idea of butting his bracing against a stake as shown in the photograph and then lining up his forms by driving wedges between the end of the brace and the stake. The wedges tend to stiffen the forms by



throwing a certain amount of compression on the bracing and thus take up any loose play. This should make the whole arrangement more solid.

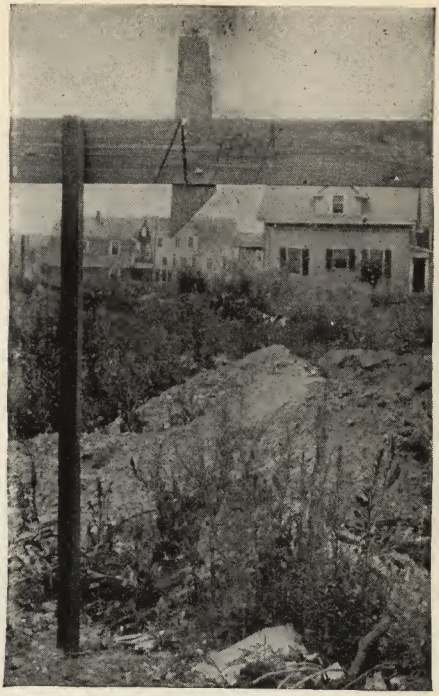
A Batter-Board "Kink"

170 On a large school job in Idaho, the H. W. Baum Co. used wire for marking the foundation lines instead of twine as is ordinarily

done. In order to center the wire on the batter-board a notch was made at the right place and the wire dropped into it, thus holding it exactly in the right spot permanently.

Permanently Marked Batter-Board

171 Few things are more important on a job than batter-boards. If a batter-board is incorrectly set or the marks inconspicuously placed, the foundation corners will be improperly located and when the building is started it will be found that many things do not fit.



The photograph shown here was taken on a job being done by H. F. The ground was considerably below the street grade and therefore a high batter-board was required. Posts were driven and horizontal boards nailed to them. The corner was marked by a notch so that it would be permanent, and as the top of the foundation was to come a foot above the top of the posts, this information was marked on the board. Support for the chalk-line was furnished by a nail set in a short stick at the proper level.

Nail Kegs for Concrete Forms

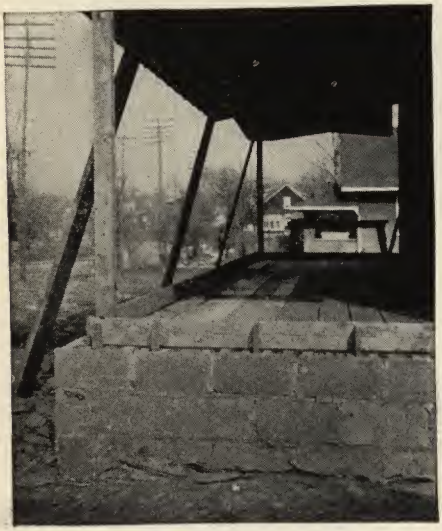
172 Why build a form when an old nail keg will do the work? The illustration shows how L. G. uses his old nail kegs and saves money. This "kink" would not do,

of course, where a deep footing was required, but it works fine where only a shallow pier is needed.

Simply dig a shallow hole, drop in the keg, fill it with concrete, and the job is done. When the concrete hardens, the keg may be broken and removed.

Concrete-Form Short Cut

173 In the example illustrated it was required to pour a concrete porch floor on a porch supported by concrete blocks. As a quick and easy way of holding the side firm the builder simply drove wedges into the holes in the concrete blocks and nailed a piece of board to them.



Concrete Course over Random Stone Foundation

174 To reduce the cost of a building, contractors generally use materials most readily available if these materials are suitable to the purpose required. J. M. is a firm believer in the above statement and so, instead of building a concrete foundation for which crushed stone would be necessary, he uses random stone which is found in the vicinity.

The difficulty in building a random stone foundation is in finishing off

the top to a smooth surface so that the upper portion of the wall can be laid without undue trouble. Much chipping and fitting of small pieces is required and this is expensive.

This builder, however, simply lays his foundation to a short distance below the grade level, builds a shallow form on the foundation and pours a 1-foot-deep belt all around.

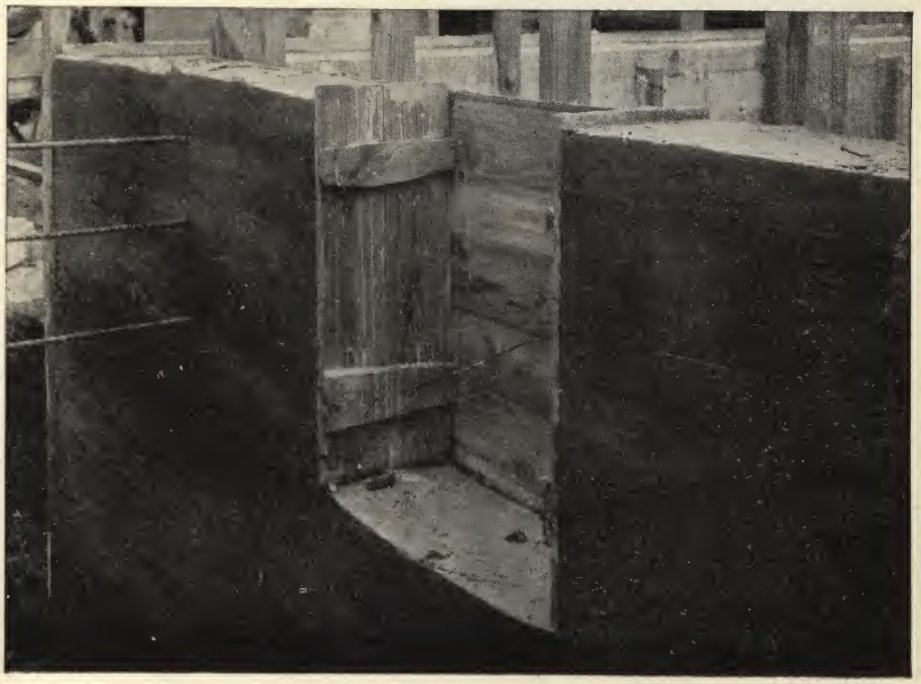
The concrete fills all the hollows and provides a smooth top surface for laying the upper wall (which in this case was concrete blocks), thus doing away with the expensive chipping and fitting. This concrete belt course also gives the foundation a better appearance on the outside than if the stone were allowed to show above the grade.

Formwork for a Basement Window Opening

175 The formwork shown here for basement window opening seems to be as simple a bit of carpentering as is possible under the circumstances.

Two forms are cut to the depth of the window frame and set between the foundation forms as shown in the illustration. They are held in place by means of nails driven through the wall forms and into the edges of the vertical pieces shown fastened together with cleats.

It does not seem necessary to fit a bottom piece for the opening, for the concrete in this instance did not seem to flow about the level of the bottom of the form. This stunt works best where a comparatively dry mix is used.



It means a saving of both labor and material since it is not necessary to use lumber for a bottom-sill piece nor is it necessary to use labor to fit it in place.

Building on an Ash Dump

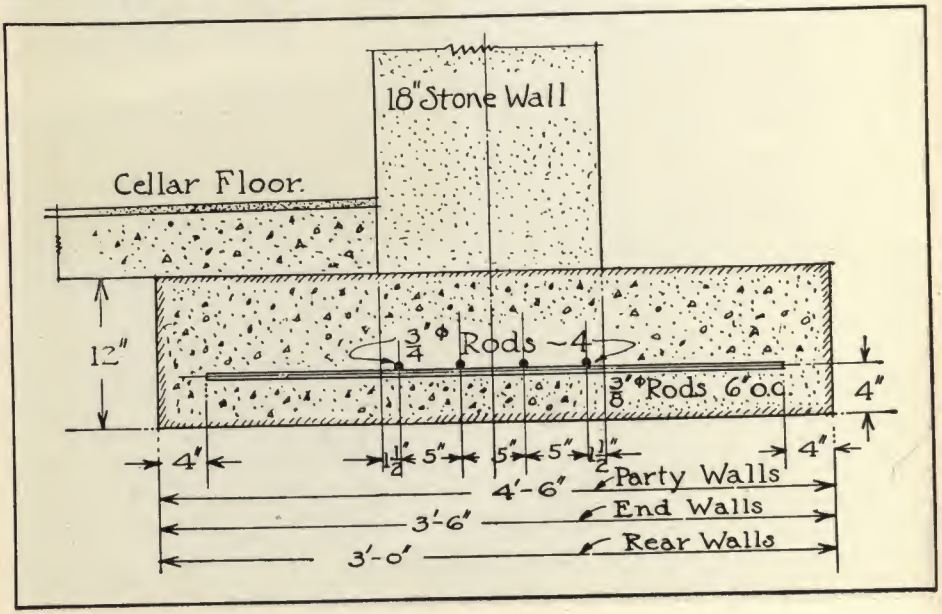
176 In a great many cities where available vacant ground is becoming scarce it becomes necessary to utilize the city dumps for residential purposes. The growing city soon encroaches on the filled-in ground that was once far on its outskirts.

Notwithstanding the work of the dump pickers, who gather the cans, bottles, metal and other valuable bits of the city's discarded effects, there always remains a great lot of compressible material among the ashes. It is the latter which creates in the minds of prospective purchasers of home sites the fear of future settlement of the buildings erected there.

The writer has, for many years, successfully built and sold numerous blocks of brick and stone dwellings on deep ash dumps in the city of Philadelphia. The houses are thoroughly modern and sold for an average price of $7000 each. As may be inferred, special attention was given to the distribution of the soil load. On lots which had lain 15 years filled to a depth of 20 feet with city ashes, the digging of the cellars disclosed the expected coal ashes, broken china and metal objects.

The combustible articles had disappeared, owing to the ever present dump fires during the filling in, and the things liable to decay had gone.

The terraces around the completed houses were formed of ashes shoveled out of the cellars and the grass sod planted there later grew with unusual vigor, due, no doubt, to the excellent drainage through the light soil. The cellars were always dry. The houses were of the row type, less than 16 feet in width, with 18-inch thick stone walls and 9-inch thick brick walls, two stories in height.



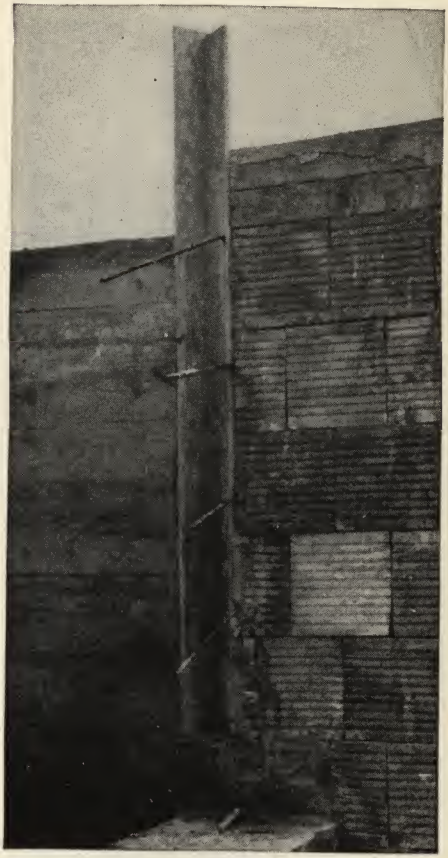
Footings of 1-2-4 slag concrete with a typical section, as shown, are placed under the stone walls entirely below the level of the cellar floor. As the ordinary dwelling house of this type, with an assumed live floor load of 40 pounds per square foot, shows, on calculation, a soil load of between 2900 and 3900 pounds per foot of length of wall, depending, of course, on their location (whether a party wall or not), the distributed load is less than 1000 pounds per square foot of soil with the concrete footings shown. Soils such as described safely carry, on test and in practice, a somewhat greater load than this. However, tests should be made if no other data are available.

During the construction, comparative weekly readings with a builders' level were made, using a fixed bench mark, and the results showed no uneven settlement in the buildings and future years proved the houses as stable as others built on natural ground.

Foundation Joint

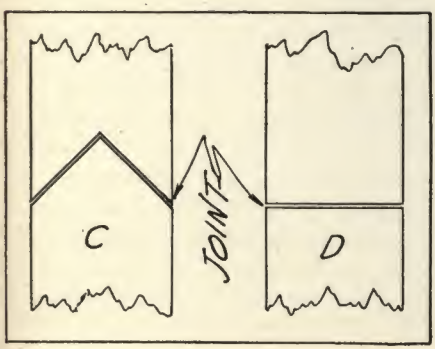
177 It is becoming common practice for concrete contractors to make foundation joints as shown in (C) in the sketch, instead of as shown in (D). When it becomes necessary to stop work for the day, two boards are set at right angles to each other, as shown in the illustration, and toe-nailed to the forms. They serve as a stop, preventing the flow of concrete.

By using this method of stopping



the flow of concrete in foundation forms a clean, sharp joint is produced instead of a ragged, sloppy joint which some builders deem satisfactory. Another advantage of this kind of joint is that no fitting of a stop is necessary since the two boards which form the V can be indented to a sharp angle or not, as suits conditions.

Some contractors claim that this V-joint is superior to a butt joint

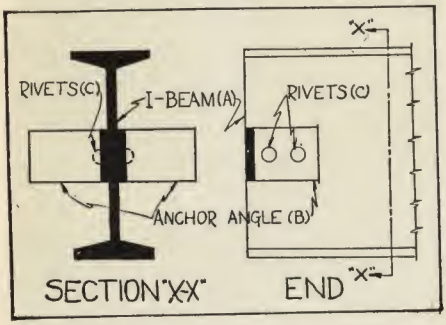


because it served to lock the two sections together, especially if a few rods are set in, as shown in the illustration.

An item worthy of notice is the fact that hollow tile was used for foundation lining as protection against dampness in the basement.

Anchoring Steel Beams in Foundation

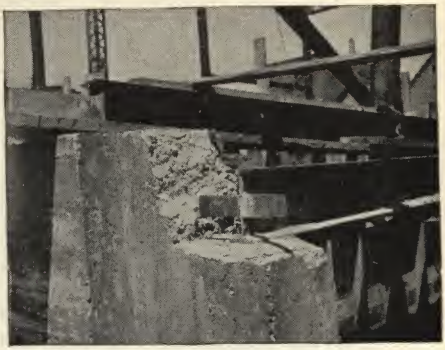
178 In the construction of small brick buildings, such as two-apartment buildings and residences, it has come to be the custom to install steel columns and floor girders instead of the wood columns and girders formerly used.



This is due to several reasons, chief among which is the fact that today, the investment in steel is not so very much greater, proportionately, than that in timber when compared with the prices of some fifteen or twenty years ago when it was a most unusual thing to see steel going into a small house. Also, the distribution of steel has been improved and it may readily be obtained in any town of reasonable size.

When installing steel girders it has been the custom among certain builders to set the girder on a plate which has been bedded in cement mortar to the proper level in the foundation. No attempt was made at anchoring the end girder.

It is the writer's opinion, however, that the man who neglects to anchor the end girder to the foundation wall is not taking into account all of the



possible little details which go to make for better construction.

Anchoring the end girder is a simple process and may be accomplished with little extra expense and practically no extra labor for installation on the job. Reference to the sketch will illustrate how this may best be accomplished.

To the I-beam (A) which is used for the girder, a pair of anchor angles (B) are fastened. Only two rivets (C) will be needed, and as these may be attached in the fabricating shop where everything is done by machinery, the expense will be small.

The anchor angles (B) will cost practically nothing since they may be cut from any piece of scrap angle lying around in the shop, only a 3-inch length of angle is required. That part of the angle (B) which extends out at right angles from the I-beam (A) should be at least 5 inches long, although the longer, the better. The other leg of the angle (B) need be only long enough to take one or two rivets.

When a floor girder is anchored in this fashion the builder may rest assured that it will never be displaced unless the foundation is destroyed.

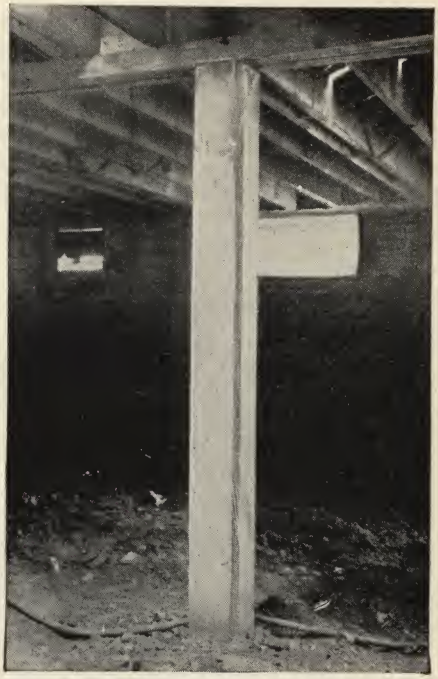
Reinforcing in Foundations

179 In foundations for small buildings, where reinforcing is placed in the wall but not in the footing, the method shown here is a satisfactory method to employ. Small pieces of reinforcing rods, about 1 foot 6 inches long, are set in the footing and allowed to stick up above the top of the footing for about 6 inches.

When the reinforcing rods for the wall are placed they may be tied with wire to the part of the rod in the footing which projects above the surface. This will serve to hold them firmly in position and prevent their being moved by the concrete as it is poured.

Precast Concrete Basement Columns

180 Many things are used for basement columns but H. V., a builder of Sioux Falls, Ia., claims some particular advantages



for the precast concrete columns he uses. They can be made when a workman has spare time and can be delivered on the job when needed. These columns are 8 inches square and to prevent chipping the corners are chamfered. A 1-3-6 mixture, using no stone larger than will pass through a ⅜-inch screen is recommended to secure a good column.

"Popping" in Plaster

181 Lime which has been overburned or which has been burned during hydration is the cause of popping in plaster, tests made at

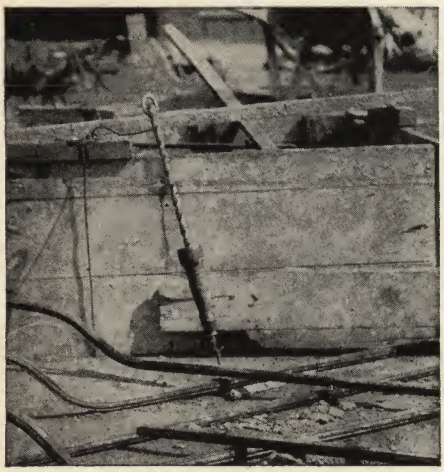
the Bureau of Standards have shown. In this type of failure small particles appear to expand and push themselves out of the plaster, leaving tiny holes.

In extreme cases these holes may be sufficiently large or numerous to be unsightly. It has been shown that popping will not be serious if the lime is ground fine enough to pass a No. 50 sieve, as in that case the lime will be completely hydrated during the mixing and application, or else the particles of defective lime will be too small to cause noticeable holes.

Tying Reinforcing

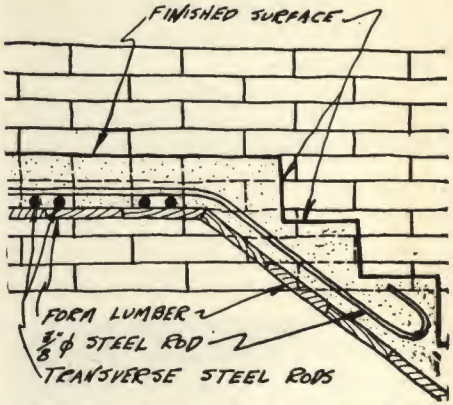
182 One of the meanest jobs on reinforced concrete work is the tying together of the reinforcing with wire. The simplest way of doing this work that it has ever been the fortune of the writer to see was the method used by R. P. B. He uses nothing but ordinary bag tier and bag tie wires as shown in the photograph.

Instead of cutting a length of wire, inserting it in and twisting it with pliers, by using a bag tier one simply slips a tie wire around the reinforcing rods, hooks the bag tier in the loops of the tie wire, gives a tug on the handle and lo! the job is done.



Reinforced Concrete Porch Floor and Steps

183 The photograph below illustrates how one firm of builders lay reinforced concrete porch floors and steps.

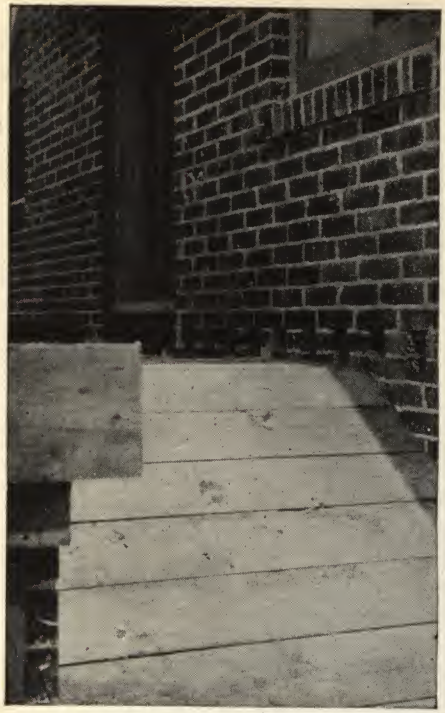


At the level of the two brick courses where the floor is to be laid, two headers are laid, one on top of each other and spaced apart, the width of a brick.

The steel rods which form the reinforcing rest in the bottom of the openings shown and in the bottom of similar openings in the opposite wall. The formwork is braced and supported from the ground below.

When the rods are set and the concrete is poured, the openings in which the rods are placed become filled with concrete, which is part of the slab, and not only serve to fill in wall openings but also affords a good bond between the brick wall and the concrete porch floor, a thing which is very desirable.

The formwork shown in the front

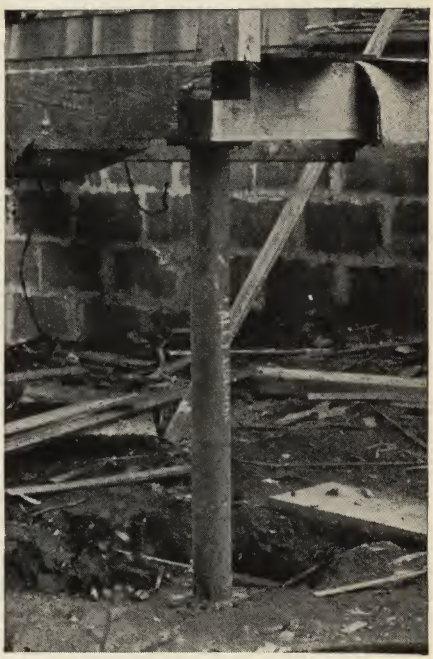


of the picture forms the base of a short flight of steps from the porch to the grade level. It is recommended that a few rods be run across the rods which span the porch floor between walls and these rods bent into the step form as shown in the diagram. He claims that these rods will serve to bond the steps to the porch floor and will prevent the cracking which generally occurs at the point where the steps meet the floor.

Steel Columns Under Porch Posts

184 The ordinary method of building up for porch posts is to carry a concrete or a rubble pier up to the grade from the foundation level and to rest the post on this pier. Here, however, is another way of doing the job.

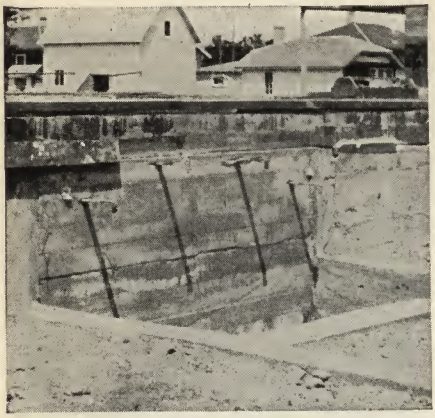
A hole is dug to the proper depth and a footing put in. A standard building column of a height equal to the distance between the underside of the porch girder and the top of the footing is set on top of the footing and used to support the porch post, as shown in the illustration. Where a concrete pier is more expensive than a building column, the method shown here may well be used to save money.



Binding Concrete Steps to Foundation

185 The illustration shows how Wallgren & Edlund, contractors of Fargo, N. D., bind concrete steps to a concrete foundation. The iron straps shown projecting from the foundation wall are $\frac{3}{16}$ inch thick, bent at both ends, and are placed in the forms when the foundation is poured.

When the building is ready for the front steps, the forms are butted against the foundation and when the steps are poured the iron straps projecting into them serve to hold them to the wall.

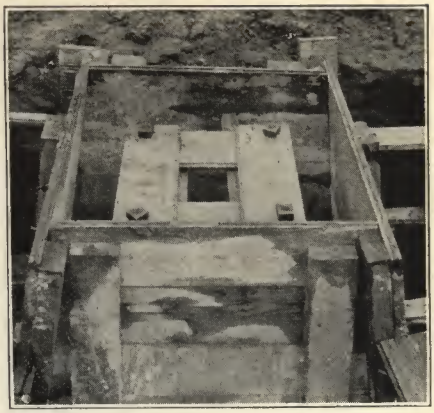


Setting Bolts in Concrete

186 It sometimes becomes necessary to set bolts in concrete, to be used as fastenings for machinery or parts, and some contractors may be puzzled as to how to do this in the cheapest and most satisfactory manner. There are many ways of locating these bolts and although the writer cannot express himself as being sure the method described below is the cheapest and most satisfactory manner, it is, nevertheless, the most efficient he has yet seen for the purpose.

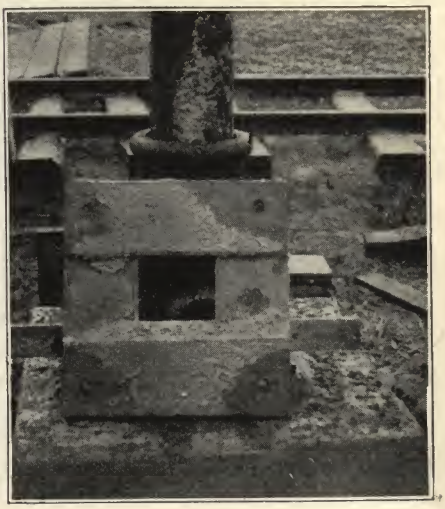
Four short pieces of 1 x 4″ are nailed in the shape of a square as shown in the first illustration and the location of the bolt holes accurately determined. Next, the holes are carefully bored and the bolts inserted, and then the whole arrangement is set in the form as shown in the second illustration.

After the concrete has set the nuts



may be unscrewed, and the square lifted off. The bolts will then be found to be securely anchored in the concrete and set at the required distance from each other. Even if the square shifts in the form the bolts will be at the required distance apart.

The distance in the concrete to which the bolt should be sunk depends entirely upon the object that is to be fastened. Heavy machinery which may be subject to strong vibrations should be fastened with large-diameter bolts sunk deeply in the concrete; light objects, such as posts, need not be so securely held.



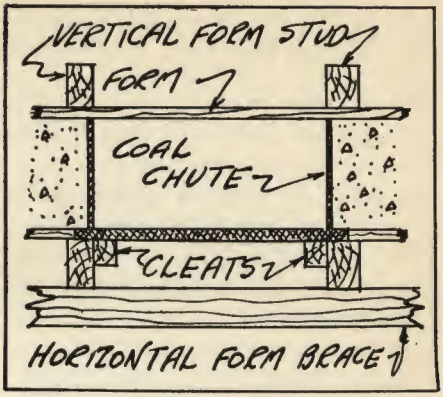
In general, it may be said that bolts should be long enough to be buried in the concrete a distance of from 4 inches to 12 inches, depending upon the object to be held in place. Under no circumstances should the distance be less than 4 inches. If the bolt is run through a heavy washer it will be more securely anchored than if no washer is used.

Setting Coal Chute in Foundation

187 There are two methods of setting a coal chute in a concrete wall. The first is setting it

in the forms before the concrete is poured and the second is leaving an opening in the wall and fitting the coal chute in the opening after the concrete has set. One method seems to be about as popular with builders as another.

The method of providing an opening in the wall and fitting the chute to the opening has some decided disadvantages. It is no easy job to fit a coal chute if the opening be a bit too small or too large. If too small, the concrete has to be chipped to the desired dimensions and this is disagreeable and expensive work.



As the writer sees it, the easiest way is to set the chute in the forms and allow the concrete to flow around it, thus making a perfect fit. The chute can be held in place by cleats as shown in the sketch.

Bends in Concrete Vent Pipe

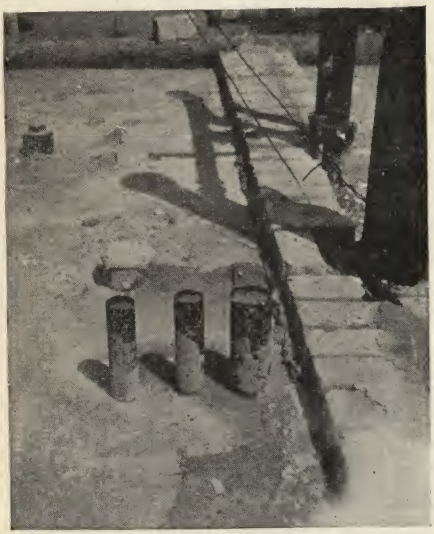
188 Where concrete vent pipe is used it sometimes becomes necessary to make an angle in

the pipe in order to avoid an obstruction. This is best done, as illustrated here.

The end of the pipe is chipped to the required angle and then blocked in place between the partition studs. The blocks should be tapered to fit the angle to which the pipe is bent. This allows the pipe to be slanted between the stud and the blocks hold it firmly in place.

Providing Openings in Concrete Slabs

189 Where water pipes and electric conduits are to be run through concrete slabs it is necessary to make some provision for them when the slab is poured.



Sheet metal tubes or "thimbles" as they are commonly called should be set on end in the forms before the concrete is poured so that it will flow around them thus leaving an opening in the slab through which the pipes or conduits may be run.

Some builders have found trouble in making the tubes stand upright. It seems that making a lip at the bottom of the tube and nailing the lip to the wood forms is not always sufficient to prevent the tubes from being overturned or deformed by the flowing concrete.

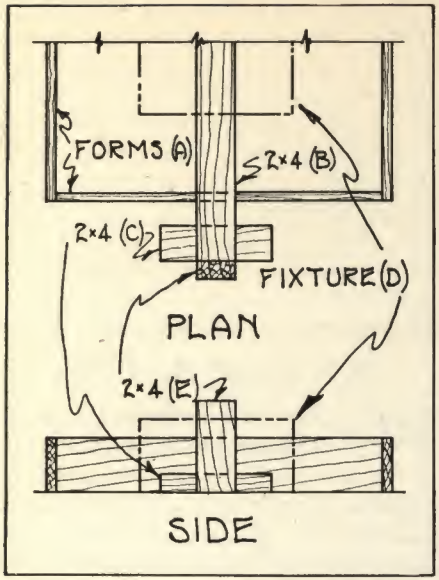
It has been found, however, that no trouble will be experienced if the tubes are filled with sand before the pouring is commenced.

Filling them with sand makes them so heavy that the flowing concrete cannot overturn them, especially if they be anchored with a nail or two. Since they are filled with an unyielding material they will not be liable to be bent out of shape.

The illustration below shows the type of tubes that can be used for this purpose and also the result accomplished by filling them with sand.

Holding a Fixture in a Concrete Slab

190 There are occasional instances where it becomes necessary to hold fixtures such as chute openings and the like in concrete slabs until the concrete can be poured about them. The essential thing to look for in a case of this



kind is to see that the fixture is so held in place that it will not be moved out of position by the concrete as it is poured into the form.

It should be borne in mind that the concrete flowing into the forms has a great pushing power and the fixture is liable to be displaced, thus causing no end of trouble to get it back into position after the concrete hardens.

Where reinforcement is not used in the slab, it will be found wise to follow the example of this builder. He sets a supplementary form (A) about the fixture (D) which is held to the floor forms by a 2 x 4″ (B) which bears down upon it. The 2 x 4″ (B) is held to two cleats (C) nailed to the floor forms, by means of two short pieces of 2 x 4″ (E), which run vertically, thus forming an inverted saddle which holds the fixture (D) in place. Concrete is then poured inside forms (A).

After the concrete has set, the dead weight of the fixture and concrete together will be sufficient to prevent the fixture (D) from being moved out of position by the flowing concrete. The forms (A) may then be removed and the rest of the slab poured.

Making Exterior Trim on the Job

191 Where exterior trim is cast of concrete it may be made on the job to advantage provided sufficient room for curing it is available. A plaster of paris mould, a box, a tamp, and a husky man are all that is required.

The box is a simple affair, built so that the sides and ends may be removed when the tamping is completed. For a job of this kind several top pieces must be provided for

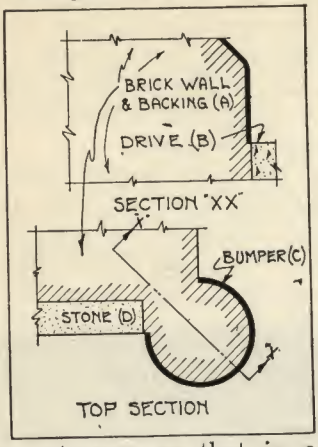
the box to form a base upon which the piece of trim may rest while curing. Plaster of paris moulds are generally set in the bottom as required. For simpler ornaments the moulds may be of wood or sheet metal.

Notice that the sides of the box

are held together with joiner's clamps. When the clamps are removed, the sides of the box fall apart, thus making the removal of the moulded piece easy.

Solid Backing for Garage Bumpers

192 It is a common thing to set metal (generally cast steel) bumpers at the corners of



garage entrances so that in case a vehicle does not clear the opening the damage will be done to the bumper, and not to the wall or the door frame.

It is best to back up the bumper with solid masonry. None of these bumpers are cast solid, and while they present the same degree of strength whether backed or not, a good blow from a heavy truck will often prove that instead of being set in a solid wall, the bumper was merely anchored in place with a few steel rods and no attempt whatsoever made to back it up.

When setting a bumper the wall should be built up and shaped to the inside of the bumper, the bumper set over the wall (A) and then anchored in place with the customary rods or bolts.

Now in the event that the bumper (C) is struck a heavy blow it has not only the strength of the steel anchors to hold it, but also a portion of a solid masonry wall over which it is placed. What is really done in this case is to armor a brick bumper with a cast steel shell, instead of simply setting the shell in place as is so often done.

Bonding a Bumping Post to a Concrete Floor

193 Building corners at the entrances to barns or garages are very likely to be damaged by vehicles coming into the building or passing out. It does not take a very heavy blow to break the corner of a brick wall and some means should be

taken to protect these brick corners against damage.

The method commonly employed is to attach a bumping post of steel or concrete at the corner. This post takes the brunt of the shock when any vehicle comes in contact with the wall corner and though the bumping post may be damaged, the corner of the building is protected. Because of their cheapness and because they may be built directly on the job, many contractors prefer to use concrete bumping posts instead of the cast iron bumping posts formerly used.

When these concrete bumping posts are built they should be bonded to the cement floor or driveway so that they will not be pushed off the wall when a wheel bears against them.

R. A. M. prefers to bond bumping posts as shown in the illustration. He placed some heavy spikes in the cement floor while it is fresh, allowing them to stick up above the surface about 3 or 4 inches. When the bumping post is built these spikes project into it at the base, thus holding it firmly in position. The heavier the spikes used and the greater distance they are allowed to project into the bumping post, the stronger the connection between the bumping post and the floor will be.

It might even be well to use ¼-inch steel rods which project into the post 8 or 10 inches, and a few rods in the mortar joints between bricks, allowed to project into the post, would also help.

Firm Joist Bearings

194 When a box sill, built of joists, is set parallel to and on top of a row of cement blocks such as are illustrated here, some difficulty may be encountered in securing a firm bearing throughout the length of the sill, due to the irregularities in the cement block.

S. Hansen, a contractor of Milwaukee, Wis., sets a dab of cement on each bar of the block and then sets the sill on these bits of fresh cement. The weight of the sill squeezes out the surplus cement underneath it and the cement which remains fills all the irregularities.

Mold for Letters on the Entrance Gate Posts

195 Where the main entrance to the farm is provided with an ornamental gate, an opportunity is provided to make the farm name or owner's name integral with the posts when constructed of concrete, rather than place this on a lettered sign, attached to the posts, as is more frequently done. It is quite simple to have the lettering a composite part of the concrete and the result is an attractive piece of work, indicative of thought and careful beforehand planning.

A carefully molded post neatly

lettered rivals a stone post in appearance, particularly where the form is made thoughtfully and the concrete fills into the corners, coming out with clean sharp edges. Block lettering which stands out as though it were chiseled is made part of this mold or form without special facilities or practice, and for this purpose the method works out very nicely for this type of decorative work with a concrete medium.

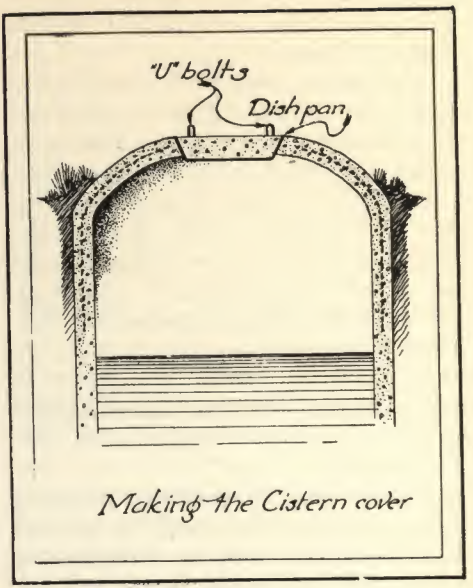
Simply block out the desired lettering as shown in the side of the form which will face forward. This side of the form should be in thickness corresponding to the height desired in the letters. An inch high or a board an inch thick will bring out the lettering sufficiently to cause a distinct shadow in the light. The panel of the form, after being blocked out, is cut through, leaving the recesses for the concrete, and an outside backing is placed at this position on the back board.

The letters are cut with a keyhole or thin fretwork saw. The edges are smoothed with sandpaper. It will be obvious where the one form is used for both posts, this work is only required to be done once and the posts will be alike. However, where a different lettering is required on the two posts, this is done by changing this panel to correspond.

Decorative work in concrete is not only possible but profitable and pleasing.

Cistern Cover

196 A good way to make a cover for a cistern when the side walls and top are concrete is shown in the accompanying drawing. After the side wall forms have been filled, a dishpan, right side up,



is placed in the exact center on top of the form. The pan is next filled with concrete, puddled well, and two U-bolts inserted for handles. Thus weighted down the cistern is finished off, and the whole left to cure.

When the time comes for removing the forms the concrete within the pan is lifted out and set aside and the forms removed. The cover is then removed from the pan and placed in the opening as shown.

Two distinct advantages are found in this method. No time is lost and no materials are used in making the forms for the cover. The pan can be used again. The top fits snugly, is flush with the top, is sightly, and there is no danger of its dropping in. There is no danger of a child's pushing the cover to one side to look in out of curiosity.

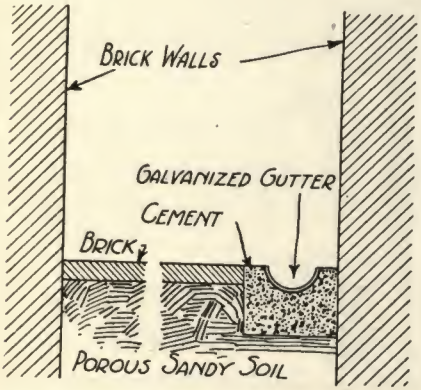
A Water-Proofed Gutter

197 C. P. B. sent this account of a small job he had recently, somewhat out of the ordinary.

He had been notified by a client of a complaint from the Board of Health to have corrected a leak from a defective gutter causing waste water to flow into a cellar of an adjacent property, same to be corrected within five days.

The difficulty seemed to be to keep the running water off the cement until same would have a chance to set. He obtained an ordinary hanging gutter, using it as a form for the cement as shown. It will be left there and when it has rusted away will still have a cement gutter in its place.

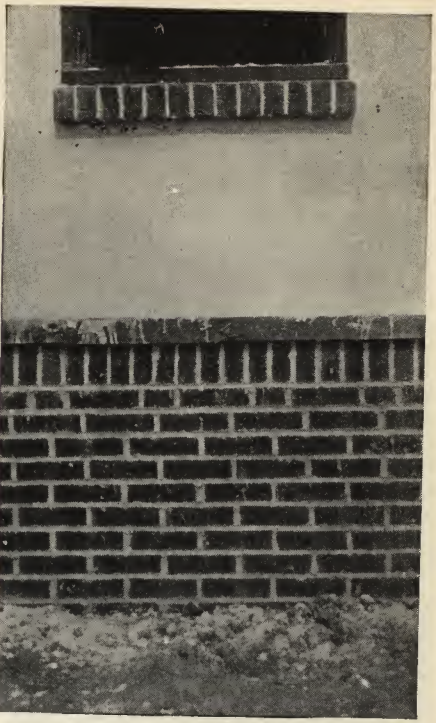
It might be added that with the rust to wash over it the gutter will be about as permanent a piece of cement in time as it will be waterproof.



To Prevent Stucco Stain on Brick Foundation

198 When doing stucco work above a brick foundation the little kink shown, which was used on a housing development by a Des Moines contractor, is a good way to prevent the splashing of stucco over the brick base.

This little stunt consists of nothing more or less than a piece of 1 x 4″ nailed to the brickwork where the



stucco line begins. Any stucco falling from the plaster's trowel will strike the edge of the 1 x 4″ and be deflected away from the brick wall, dripping over the edge of the 1 x 4″ to the ground without touching the brick.

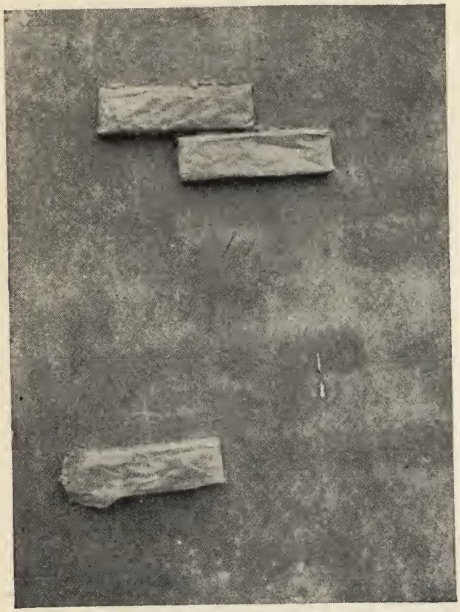
Note the stucco lying on the ground at the base of the wall which has dropped while the stuccoing was in progress and note the comparatively clean surface of the brick base.

Protecting Random-Placed Brick From Stucco Stains

199 In certain types of wall decoration where random brick are set, the method shown here is a good way to prevent the brick being stained by stucco. The brick is covered with ordinary wrapping paper and set into the wall with the

paper around it. The stucco will not stain the brick since the paper wrapped around it acts as a protective coat.

When the job is done the paper can be torn off. It is possible to cover



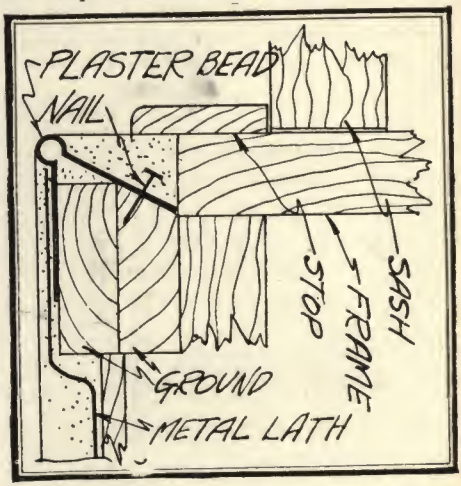
only half the brick with paper, holding the paper by tying twine around the brick. If the twine used is strong and the knot well tied this method will suit the purpose admirably.

Plastering for a "No Trim" Window

200 Some architects, especially in designing houses of the Spanish type, advise that as little trim as possible be used in order to obtain the effect demanded by Spanish interiors. This calls for a special kind of construction about the window frame since casing is not used, and R. B. does the job in the fashion shown here.

Two furring strips are set against the frame or the stud, as the case may be, the inside strip being leveled as shown in the accompanying sketch. A plaster bead is set on the furring strips and fixed to them in the ordinary manner. A strip of metal lath should be set on the wall running from the corner of the bead around the furring strip to the wall. This strip of metal lath will prevent the chipping off of the plaster at the bead which might easily occur if it were omitted.

In order to hold the plaster behind the window stop a few small nails or brads are set into the inside furring strip and allowed to project above the top and into the plaster. The



joint between the plaster and the window frame is concealed by the stop when it is nailed in place. A glance at the sketch will show the job as it was planned out.

On Mortar Color

201 G. B. A. sent this in concerning the use of coloring matter in lime plaster. The only really safe way to use color is to mix up the coloring material with

the lime in the dry form and mix enough at the beginning for the whole job. It is difficult to mix separate batches from time to time and get the same amount of color through the mass. Then it is necessary to mix it very thoroughly so as to avoid splotches and streaks. As soon as the proportions have been lost it is practically impossible to mix a dry batch to match a batch which is already on the wall.

Lime is noted for its ability to carry color better than any other material and if you want to use fairly light tints it should be possible to obtain satisfactory results by taking precautions in the mixing. It is done frequently and with fine success. We recommend that you select a reliable mineral color and then make several panels of the mixture to determine which color you like best when the panels have dried out.

It is not a thing to be done in a hurry or on short notice and any time you spend in making sure that you will get a satisfactory job will be well repaid.

Another Letter on Wall Plaster Coloring

202 A well-known manufacturer of mortar color contributes this additional information.

A responsible manufacturer of wall plaster suggests the following formula:

300 pounds Sand.
100 pounds Plaster Paris.
50 pounds Hydrated Finishing Lime.
20 pounds mineral color.

These materials must be thoroughly mixed together before water is added and wet mixing must be continued until the mass is free from spots and streaks of color. Machine mixing is advised.

Even if these precautions are observed there is difficulty in producing a wall surface of perfectly uniform color, due to the general tendency of all coloring materials to follow the trowel or float used in surface finishing. Unless owner and architects will accept slight irregularity of surface color, they advise against the use of colors in interior wall plaster. Some architects and owners desire this irregularity of color tone.

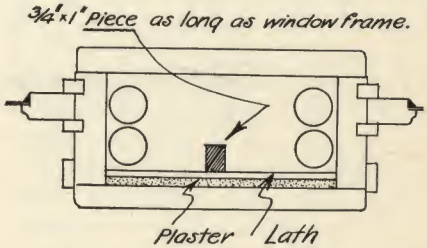
In the matter of coloring interior rough plaster, the following formula was used in a residence at Washington, D. C.:

24 quarts Washed Sand.
16 quarts White Finishing Lime.
3 quarts (4 pounds) mineral color.

The sand was rather coarse and dark in color. Surface was finished with cork float. The result—a rich deep cream color.

Helping to Keep the Cold Out

203 With all the promises of the coal man and the heater man we have no quarrel but if we want results we set them against the wall builder and watch



them fight it out. If the heat escaping from a heated house came away in the form of smoke that loss would be noticeable. And if all the cold that leaked into a house without in-

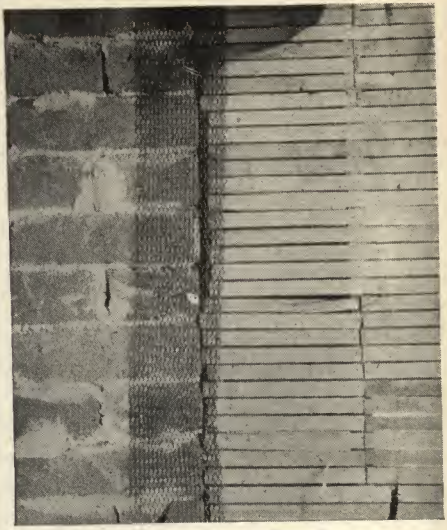
vitation carried a little odor that would be regarded. But most of the dwellers put the coal into the heater regardless and consider the leakage action as regular ventilation.

W. W. M. sent this. The illustration shows how he plasters between the mullion frames to get a tighter joint. First cut a ¾ x 1″ piece the right length, and nail pieces of lath on it the full length of the stick. This is fixed at each end, and by driving a nail here and there through the jamb into the lath. It is a great help in keeping out the cold.

One Way to Prevent Plaster Cracks

204 Few things make an owner as dissatisfied with his house as cracked plaster. No builder should overlook a chance to prevent this source of complaint. A customer with a grievance is a poor recommendation for a builder and where the expenditure of only a few cents is necessary to make a better job it is a poor business man who will attempt to save the few pennies and run the risk of having a dissatisfied client.

In the instance shown here, if a narrow strip of metal lath had not been used at the junction of the wood



lath and the cement block, an ugly crack would have been certain to result, as plastering was to be done directly on the cement blocks. This strip of metal lath cost only a very small amount and by its use the danger of a junction crack in the finished wall was considerably lessened.

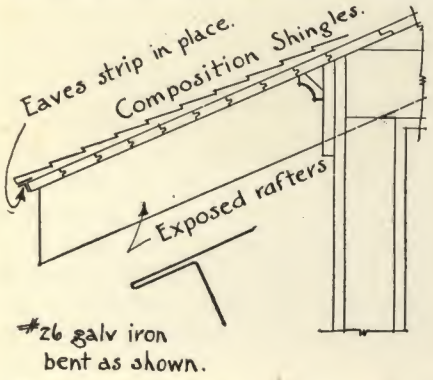
CHAPTER IX

Short Cuts in Roofing

THE roof is a very important part of any building. Much time, however, can be ineffectively employed if one does not go about the work in the right way. Difficult roof problems crop up every day and one can waste a good deal of time and money on cutting and trying. Here are a number of short cuts that will help one over many troublesome points.

Protecting Composition Shingles

205 J. E. N. submits this one on supporting and protecting the projecting edge of the shingle.



The sketch shows an eaves strip made from a 4-inch piece of No. 26 gauge galvanized iron. This strip is placed on the lower edge of the roof sheathing and around the gables to support the shingles. It is easily made, requires but little time to install, and is well worth the cost on any building where composition shingles are used.

Opening Rolls of Roofing

206 F. B. claims that he used to spend a lot of time screwing the nut off the rod placed to hold the ends on a roll of roofing. A heavy hit with the hammer on the nut end of the rod will send the nut through the metal end-cap and release the metal ends.

This was found to be a great time saver, especially when there was a burr on the end of the rod to stop the nut from coming off. He keeps some of these rods for reinforcing small slabs of concrete, he says.

Cover Old Shingles With Roofing

207 A. G. H. made a mistake with his own house and wishes to let others know about it so they may avoid doing the same thing. A few years ago the shingle roof began to leak, being old and weather worn. He decided to put on some good 3-ply roofing instead and so began to remove the old shingles. This proved to be a slow tiresome job as he had to pull out all the nails. After putting the roofing on he soon found he had made a mistake. Every summer the second story of the house becomes so hot it is impossible to sleep or live there.

If you leave the old shingles on when re-roofing you will have a warmer roof in the winter and a cooler roof in the summer. The shingles left on prevent up draft through the sheathing that is so common when a basket roof is covered with ready roofing of any sort.

A Kink for Prepared Roofing

208 If this scheme works as well as its proponent says there will be a great number of interested parties. It is from A. R. who says he finds it a good time saver for applying rubberoid or slate surface roofing. The roofing usually comes in rolls with tar for the joints and laps and it is a nuisance to get the tar to the right temperature to make it flow properly and also it is nasty stuff to handle.

By applying gasoline at all joints and laps you can get an A. No. 1 joint and a waterproof job. Take a 1-gallon gasoline can and just pour it lightly and keep going from one end to the other. After it is nailed it acts by way of vulcanizing the joints. On a 15,000 square foot factory job, which has been down a year, A. R. has not had a single leak.

As gasoline acts as a solvent we would caution anyone in his first try.

Preventing Roof Leaks

209 From H. L. H. comes the following method proved to be successful in his part of the country. First lay the double course of shingles, then starting five inches up from bottom of course, lay a sheet of waterproof paper over roof boards, which should be laid closely together. Then trowel over this paper a coating of any of the well-known brands of plastic cement and shingle up the roof as usual. The cement makes a watertight joint around the nails as driven through the shingles, and the result is a section of roof that will hold water. The coat of cement should be about ⅛ inch thick.

Another builder offers this advice. The ice melts because of the difference in temperature between the inside and the outside air. A precautionary measure would be to remove several attic windows and replace with muslin screens during the cold weather.

In case of new shingling, this method has been tried and may be of interest. Before shingling run a sheet of smooth, two-ply roofing, placing lower edge at line of crown mould. Then, over this, place a course of shingles at the eaves line, bringing them together at angles of valleys. At this point run them lower and cut to conform to desired shape of lower end of valley.

Now take a sheet of slate surfaced roofing the required length of the valley and split it lengthwise. Place in valley in regular way. Cover this with a full width sheet of slate surfaced roofing. Mark valley lines 3 inches out from center each way at the ridge and 6 inches each way from point of eaves.

Next, take plastic roofing cement and spread with a paddle a coating about 6 inches wide from butt of course laid. Lay the second course of shingles. This makes the first or double course of shingles. Strike a single chalk line and spread more cement above this line, covering about an inch above the line of exposure to the weather.

Follow this method until the roofing paper at the eaves is covered. This point is well above the plate line. Also, plaster the wood valley shingles the length of the valley to the slate surfaced roofing. A lot of work, but a guaranteed job, and may save time.

Aid to Shingling in Valleys

210 This little idea by R. F. C. may be useful to you. Instead of setting the shingles by eye a piece of 2 x 4″ is placed in the valley as shown; the shingles butted up

against it and nailed in place. When all the shingles have been set along the valley line the 2 x 4″ may be removed. By using this method a straight line along the valley shingles is assured.

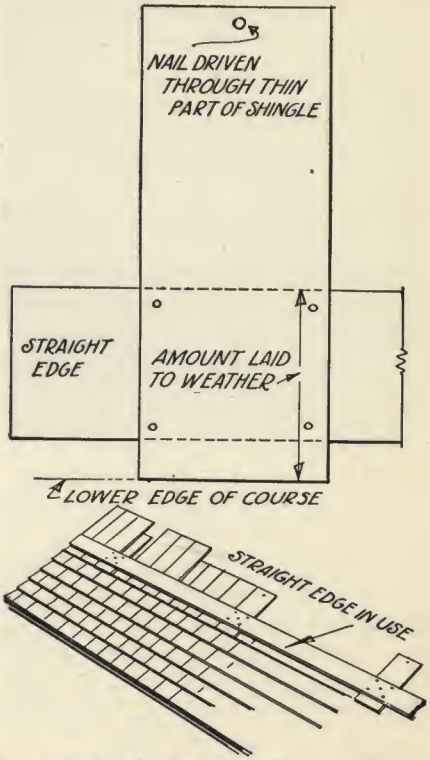
The usual method is to strike a mark on the roof sheathing with a chalk line and set the shingle on the line, or else butting the shingles against a straight edge nailed on one side of the valley, completing this side and then nailing the straight edge on the other side and working up against it.

By using the method shown here, the shingle courses may be carried around the roof without interruption if the carpenter prefers this method of operation. The 2 x 4″ set in the valley provides just enough room between the two sections of the roof to allow water to run down freely.

A good deal of time may be saved by cutting shingles on the ground to fit the angle of the valley instead of cutting them on the roof. All that is necessary is to determine the proper angle, locate the cut in a mitre box and then the work is easy.

Shingling Straight Edge

211 B. W. C. finds this straight edge very handy when shingling a roof with cedar shingles. It consists of a narrow board with



the point of the shingles nailed on the back every 4 or 5 feet. The amount to the weather is shown in the figure.

To use the straight edge place the butt of the shingle to the bottom of the last course and drive a nail in the top, about ¼ inch down. Lay the shingles against the straight edge right over the points and, when that course is laid, drive down on the straight edge and the points will pull out from under the course to be used again.

This leaves the nail concealed under the course of shingles. The straight edge can be used until the tip of the shingle is pretty well frayed or becomes too thick. Then new ones can be put on.

The roofer will find this straight edge saves a lot of time as it requires no measuring and makes no nail holes in the roof.

To Prevent Drip Stains on Shingle Walls

212 Where walls are shingled the downspouts should be set at the same time the gutters are placed, or a mark where water has run down the wall from the gutter opening, may result. If the shingles are to be painted or stained a dark color, this water discoloration will be covered but where the shingles are to be left in natural finish it will take considerable time before weathering will cover up the mark.

It sometimes happens, however, that it is not possible to place the gutters and downspouts at the same time. If the gutters are hung and the downspouts not placed some means should be provided to divert the rainwater from the wall.

In the accompanying illustration is shown a simple way of keeping the water away from the wall as it pours from the gutter opening. Two shingles, tacked as shown, do the work. This idea is, of course, only an emergency method, but it will serve the purpose for the few days it may be required.

Slate Roofer's Stake

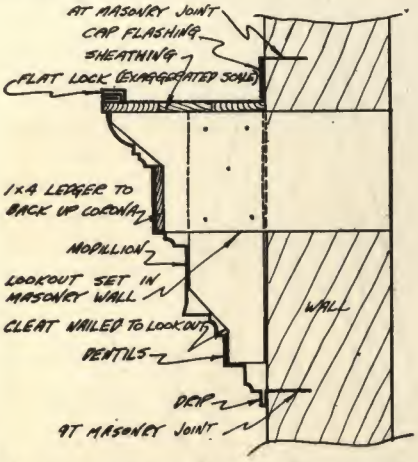
213 In the photograph is shown H. H. using a slater's stake. This stake is made of two pieces of ⅛ or 3/16-inch iron welded together

as shown in the photograph, and it may be carried anywhere around the job.

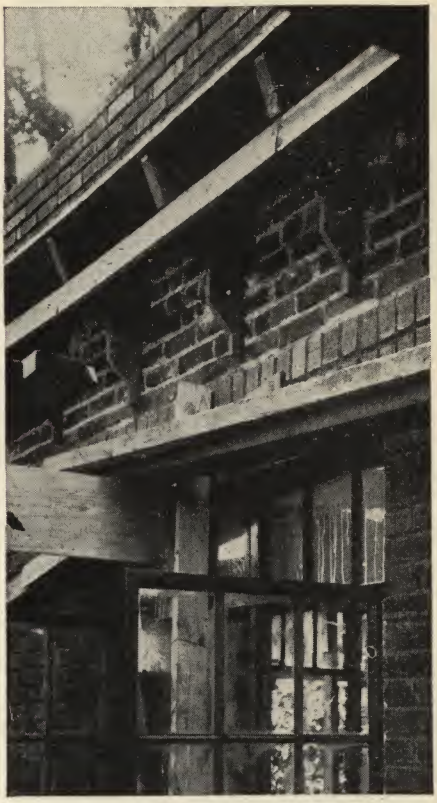
The end shown sticking in the wood is pointed and a few blows on the top serve to fix it firmly in place. In cutting slate shingles to fit around a downspout or in a valley the slate shingle is first marked and then placed upon the stake as shown in the photograph with the mark along the edge of the stake. That portion of it which is not desired is chipped off with a hammer by pounding on the slate along the line of the stake.

Framework for Hanging Sheet-Metal Cornice

214 In construction where heavy cornices are used some contractors prefer to use metal instead of stone because of the difference in weight and cost. Sheet-metal cornices, when properly protected by paint, will last a long time but if they are not erected in the proper manner they soon loosen from their base and open up and it is not long before disintegration in the form of rust sets in.



The two photographs show a method for fastening a sheet-metal cornice to a masonry wall. The sketch is a section through the wall between the lookouts and shows the wall before the cornice was fastened and the cornice in place.



Lookouts, built of 2 x 8″, support and carry the weight of the cornice. The top of the lookouts are covered with sheathing, which will be later covered with metal flashing which will fit into the lock on the upper edge of the cornice crown molding. Reference to the illustrations will show how the projecting ends of the lookouts are cut to receive the cornice.

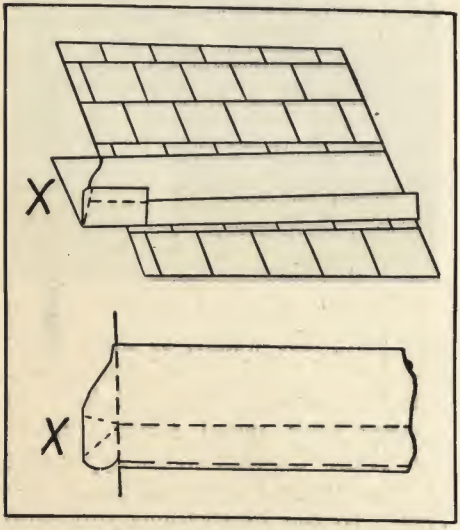
A ledger board is run across the lower ends of the lookouts to provide a backing for the corona, and cleats are nailed to the lookouts to permit

fastening the modillions and dentils. A drip is worked into the foot mold of the cornice and the metal beyond the drip sets into the masonry joint. Notice how flashing is set into wall.

Continuous Sheet and End Roof Gutter

215 When laying a sheet metal roof gutter on a new dwelling there is generally a tinner to lay. In building barns, sheds or straight roof houses in the country, that must have the water shed controlled in some manner (usually by means of a roof gutter), it is an entirely different story.

Knowing that sheet metal of the lighter gauges (27 to 30) could be formed into almost any shape desired, one builder has produced a perfectly solid end made from the gut-

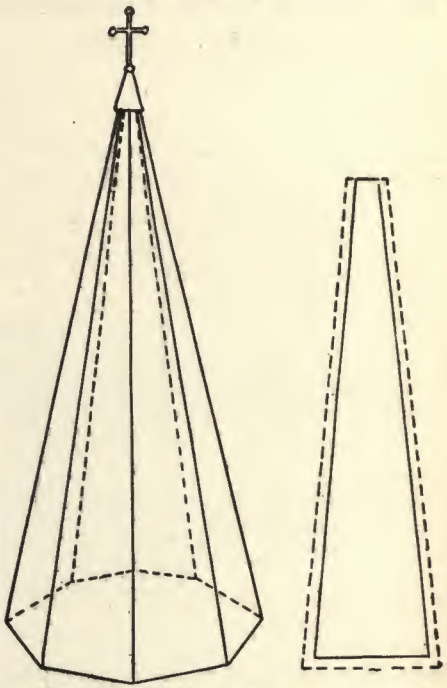


ter metal itself, with no possible chance to leak. It has passed through the test of actual formation on the roof, has been found practical and the wonder is why it was not thought of long ago.

The metal is formed and laid back of the fascia board in the usual manner, except that it must continue on past the fascia board 5 inches, as at X. This end is then sheared with a sweep similar to X, in the second figure, and with a long pronged set of pliers, fold the flat metal up and inward as indicated by the dotted lines.

Sheet Metal Roof for Church Steeple

216 Repairing the roof of a church steeple is a job in which ingenuity can frequently be used to make the work easier. Re-



cently L. S. B. had occasion to repair an octagonal steeple, that was leaking badly. It was decided to give it a sheet metal covering.

A scaffold was built up from the roof to the base of the steeple with two 2 x 8″ planks placed side by side on which to stand; a board was

nailed upon the bottom of a small extension ladder and a strap used to buckle around the steeple was attached to the other end. The length of surface to be covered, with the breadth at top and bottom of the eight sides were found, and four sections of prepared material were spread out, measured, lined and cut upon the ground in accordance with these measurements.

A section was then carried to the top of the steeple, fastened there by the narrower end, and allowed to unroll gradually, the sides being carefully tacked in place. All four sections were put up thus, on alternating sides of the steeple.

Four more sections were marked out and cut from the material, an allowance of about ½ inch being made in the width on both sides and at the lower end. This extra width gives the stock for lapping over the edges of the four sections first laid, and was nailed down smoothly and securely. When all the sections were laid and completed the corners were finished by tacking over them a neat ridge-roll 1½ inches wide.

These ridges were painted the color of the trim, while the flat metal between was painted the color of the body of the building.

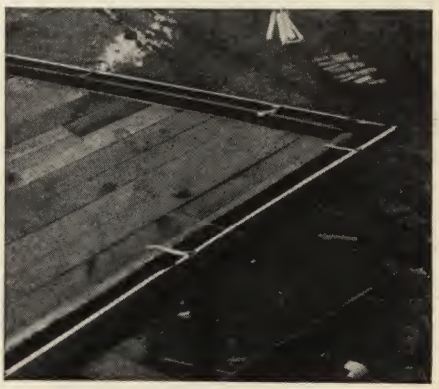
Keeping Basements Dry

217 In wet weather, water is apt to seep through foundations unless they are plastered on the inside or waterproofed in some other way. In the illustration shown here, made on a job of Meagher and Callahan of Hartford, Conn., a spare piece of gutter was used to carry the downspout water away from the foundation so that it would not come

through the wall. This, of course, is only a temporary measure to be used until the drain is installed.

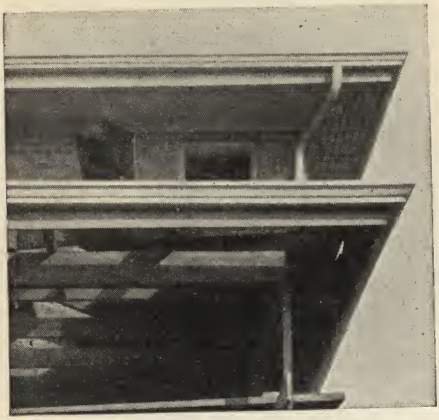
Hanging Sheet Metal Gutters

218 There are many ways of hanging sheet metal gutters, but someone always seems to have a new one. Though this stunt may not be new to everyone, nevertheless, some may find it both interesting and useful.



The gutter is made with a projection which is nailed onto the sheeting of the roof. Small notches in the

outside lip are made to accommodate the sheet metal strips which act as a brace to keep the gutter from sagging.



When the job is completed the method of holding the gutter can not be seen from below. This makes a nice clean cut job and quite different from the one where the gutter wires or gutter hangers can be seen.

A Roof Gutter

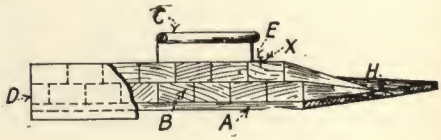
219 In building a porch around a corner of his home, a Middle Western builder had difficulty in constructing a wood channel which was to be lined with tin to form the roof gutter. His attempt to bend a beveled bottom board (pitched to the shingle roof) to the circle of shingles by sawing across the board at ½ inch intervals in the "head-of-a-coffin" method proved a failure.

The sheeting had already been nailed down with a two-way pitch from the center of the roof. No provision had been made for keeping the water from flowing over the eave, when the idea of a water channel as shown at H in the drawing was conceived.

After twelve years of service in withstanding the sudden changes in this climate, it has no split or leaky seams, and the tin is sound from the fact that no sharp turns were formed as would be necessary in laying a deep gutter which would hold ice, soot and sediment, disastrous to the tin and seams.

In order to have a solid base for the tin and at the same time direct the water back from the eave, it was decided that two rows of shingles be laid, one upon the other with their butts flush with the eave edge.

The flat seam tin roof was laid in the usual manner, except it was extended over the eave a sufficient distance to allow of its being malleted down over the butts of the shingles, sheeting board and secured by nailing into the latter. (A).



After the roof was laid, a beaded extension flash (C) was nailed over the tin to flush the eave. This extension is made by cutting the required number of strips 2½ to 3 inches wide, according to the height wanted for the flash. The mailing flange is formed at a right angle ½ inch wide; the bead will take ¾ inch more stock, hence if the strips are cut 2½ inches wide, the top of the extension will stand slightly more than 1¼ inches high, a good height for any ordinary sized porch.

The extension is nailed through the ½-inch flange (E), back of the bead and should be nailed close; the outer edge of this flange is formed up (X) and over the nail heads, hammered smooth and tight forming a "blind nail" to be soldered over completing

the flash or it may be smoothed over with the mixture used for leaks.

Laying the tin roof over the corner circle is merely a continuation of the main roof, with due observance that the tin projects over the edge of the circle at all points far enough to cover the shingle butts, the sheeting board edge and extend down on shingles.

The tin is then sheaved to a true circular sheathing and enlarged in radius to the outer width of the eave projection. It is then snipped back to the sheeting board in ½-inch cuts when it can be malleted down and nailed to the sheeting (A) as shown at (D), as readily as if a straight edge.

Building a neat circle with the flash extension is somewhat more difficult, yet it can be done nicely by snipping the nailing flange, and use a small three corner file to cut into the back of the bead at near 1-inch intervals. Use care in bending the bead to the radius of the circle when nailing the flash and a presentable front will have been obtained.

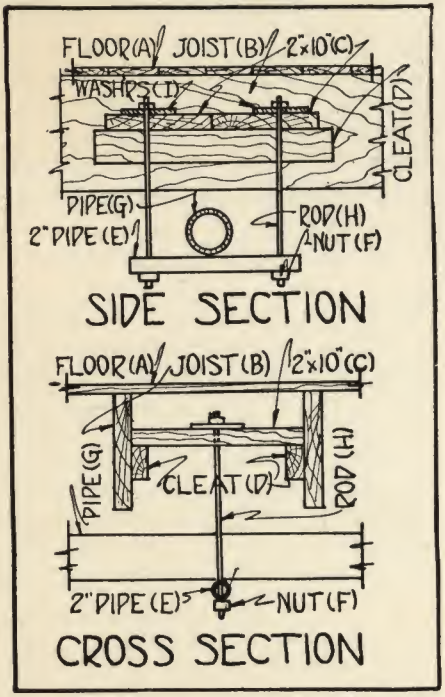
CHAPTER X

Short Cuts in Plumbing and Heating

MUCH time is wasted on plumbing installation work because the bricklayer or carpenter neglected to allow proper space for pipes etc. There is no excuse for so much unnecessary cutting. Simply think out the problems ahead of time and many hours of needless work will be saved. Here are a number of good short cuts that may be applied on many jobs to good advantage.

Hanging Heavy Pipes

220 In basements where heavy pipes are to be run it is sometimes a problem to support them. The first means of support



that generally presents itself is the floor system of the floor above.

In building up this kind of a hanger system the line of piping should be marked on the joists so that the location of the hangers will

be determined. After the location has been made the cleats (D) should be set in place between the joists.

These cleats should be made of short sections of 2 x 4″, firmly nailed to the floor joists for they are the main support of the system. Across these 2 x 4″s (D) short sections of joists should be set to form a shelf.

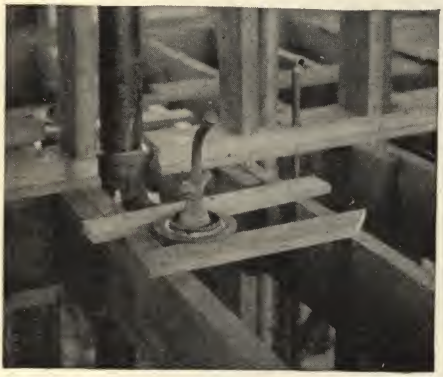
These pieces need not be nailed to the cleats but it is well to tack them with at least one nail so that they will not be liable to shift. They must fit tightly between the joists so that they take a firm bearing on the cleats. This shelf (C) should be bored to take the steel rods (H) which carry the pipe (E).

The pipe which is supported (G)

is held in the saddle formed by the pipe (E) and the two rods (H). In order to prevent the rods (H) from being pulled through the shelf (C) a large sized washer should be used as illustrated. If the pipe saddle (E) is not truly level it may be made so by tightening or loosening the nut (F).

Hanging Soil Pipe

221 In this case, the soil stacks were erected before the floor was in place. Since the elbow shown in the foreground was laid parallel to the joists, it could not



be supported on them, hence two short cleats were set across the joist to catch the lip at the end of the elbow and thus furnish the required support until a more permanent method of holding it could be installed.

Saddle for Hanging Vent Pipe

222 In building up lines of sheet-metal vent piping the contractor is sometimes hard put for a method of supporting the line at the base. Some support is necessary since the bands holding the pipes to the joints or to the walls can hardly be depended upon to keep them from slipping downward.

A California builder uses the method shown here. A saddle was built

of three short pieces of wood, the two vertical pieces being 1 x 4″ and the horizontal piece 2 x 4″, and swing from the joists. Where an elbow occurred in the line the pipe was carried in the saddle. Since the sheet-metal pipe is not heavy, this arrangement may be depended upon to carry the load.

Closing End Openings in Lead Pipes

223 It is unwise to leave plumbing pipes open at the ends, but how to close them in an easy and inexpensive manner has sometimes been a problem. The accompanying illustration shows the method used by an Atlanta, Ga., contractor to close an end opening in a piece of 5-inch lead pipe.

The edges of the pipe are ham-

mered toward the center from two opposite points on the circumference until the opening is closed. To seal the opening, a little solder is applied to the crack, thus making it tight.

Protection for Pipe Ends

224 When threaded pipe ends project up through a floor some protection is necessary to prevent battering the threads. This illustration shows how Keefe Brothers of Worcester provide this protection.

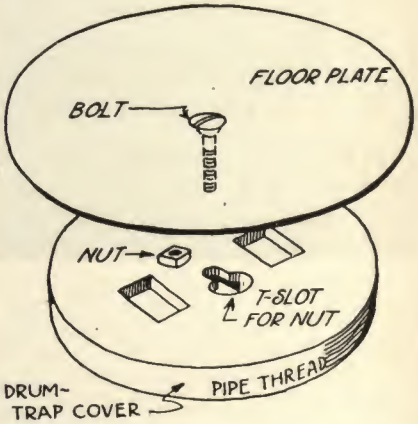
They simply nail four pieces of scrap lumber in the form of a hollow square and set it over the projecting

pipe. This serves to prevent the ends from being bumped or knocked since the pieces of boards act as fenders.

A Drum Trap Cover

225 H. V. turns in this kink and says that he hopes he is not trespassing on the ethics of the profession, but as a plumber it appeals to him. For various reasons drumtraps and their covers are sometimes hard to manage so that the floor is clear above. Changes in flooring are sometimes required while building is under way, and after the plumbing is worked. Or a slight tip to the trap in placing, and so on.

Whoever thought of this made a cover for the trap direct and left a recess into which a nut could be inserted, much as the head of a T-bolt is put into a T-slot. The cover may be any reasonable distance below the level of the finished floor, and, when



ready, a flat head screw is cut to the required length, slipped through a slightly counter-sunk hole in a thin floor plate and screwed into the nut in the trap cover.

A Study in Compactness

226 Here is how a southern contractor arranged his heating units around a basement pier and so instead of obstructing the

basement at several different points, placed all his heating apparatus in one location, thus leaving the rest of the basement clear.

Extra Header for Heavy Pipes

227 The problem of locating heavy soil pipe in a second floor bathroom was solved in the manner shown below by framing the obstructing joists to an extra header, thus making deep cuts in load bearing joists unnecessary. This cost a bit more than simply cutting the joist but it made a much better job.

The Septic Tank

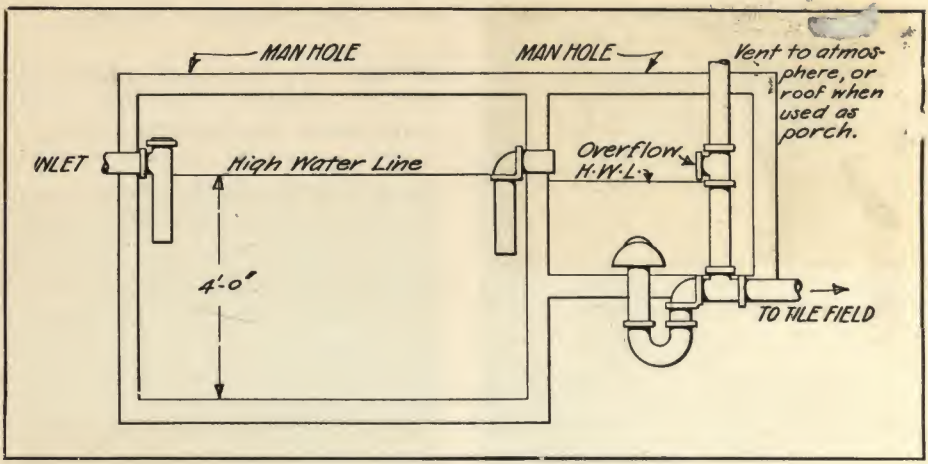
228 W. H. S. sent in this discussion regarding septic tanks—their location and design.

The outlet in a properly designed septic tank should be below the inlet. It is well to provide a grease-trap but in practice it is seldom done. He has been building septic tanks for several years and has not found it necessary to use a separate grease-trap, although it would help conserve the anaerobic bacteria.

The whole trouble with septic tanks is that they are such in name and not in fact. A properly designed septic tank will handle the sewage for many years without any attention and without any odors. W. H. S. has built several genuine septic tanks as front porches in fine residences, and finds that their presence is not known unless attention is called to it.

The first one built by this contractor was under front porch, the only logical place that this tank could be put, and it was with some doubt that the job was tackled. Since that time he has built several more which give entire satisfaction.

Do not think you can build a septic tank unless you understand the principles on which they work. And



by all means use a good syphon valve and proper ventilation. Every tank should be designed according to the number of persons expected to use it, and the amount of field tile proportioned to the capacity of the "dosing" chamber. There can be no hard and fast rules regulating the size as there are so many elements to consider, drainage, character and composition of soil, etc.

Pipe Outlet at Window Frame

229 Sometimes it becomes necessary to lead pipes outside of buildings as in the case of providing a sprinkler outlet for watering the lawn. Seldom, if ever, is provision made for a thimble when the foundation is being poured, and in order to bring the pipes outside the building it becomes necessary to drill through the entire thickness of the wall.

We may, however, take a tip from this El Paso, Texas, contractor, who, when it becomes necessary to provide an outlet for a pipe, uses the junction of the window frame and the wall as the point to bring it through. It is necessary then, to drill only a short distance through the foundation.

Fixing a Soap Dish

230 It is sometimes difficult to provide a good setting for a built-in soap dish. The method shown here may prove of value.

The opening for the soap dish is framed with 2 x 4″s and small nails are driven in the 2 x 4″s as shown in order to hold the cement.

The opening is filled with cement and the soap dish set and held in place by two laths as shown in the illustration.

Concrete Base for Heating Plant

231 Where concrete floors are laid in basements it is customary to set the heating plant directly on the floor, it being considered that the thickness of the floor is such that it will support the plant without danger of accident. This is all right where the ground is solid but for soft ground, or in places where considerable moisture abounds, it may be profitable to build a separate foundation for the heating plant.

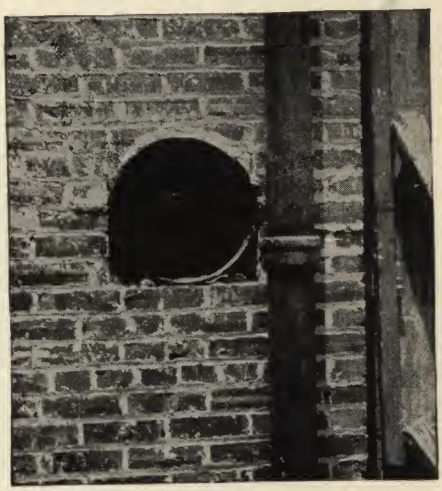
The concrete base is about twice as thick as the floor which will be built around it, thus preventing its punching through the floor in case the soil beneath is softened and sinks away slightly.

Wrought Iron Thimble

232 Thimbles to permit the passage of pipes and flues through brick walls are generally made of galvanized iron or light sheet metal and the corbel effect of the brick work is usually calculated to span the opening.

Not so in this instance, however, which was installed by J. A. McK. The building was an exceptionally fine residence and as the opening was for a 12-inch flue, a wrought iron ring ¼ inch thick and 1½ inch wide was made in a local blacksmith shop.

The ring is held to the wall by four



¼-inch bolts which extend into the masonry. This ring is sufficiently strong to act as a lintel over the opening and it may be depended upon to maintain its shape, thus assuring an easy fit when the time comes to set the smoke pipe.

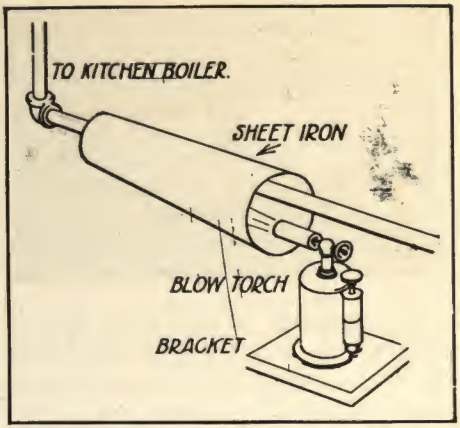
An Emergency Hot Water Heater

233 The illustration shows how one man heats water for the bath during summer months when there is no fire in the furnace. A heavy strip of sheet iron is bent to form a part cone about 6 inches in

diameter and 3 feet long. This is placed over the return pipe from the furnace.

A small bracket is placed below at one end for a gasoline blow torch. The flame from the torch sheets into the sleeve and the water in the range boiler is quickly heated. Ordinarily thirty minutes' use of the torch will heat the boiler of water.

To make it more efficient the sheet iron can be lagged, though both ends should be left open to permit an even flow of heat.



CHAPTER XI

Miscellaneous Short Cuts

THERE are quite a number of little things to do around a building to complete it outside the work of major trades. Electrical work, painting, decorating, landscaping, for example. Many old buildings can be made better paying investments by bringing the building up to date. Simple remodeling quite often will do this. The field of remodeling offers many chances for paying jobs on the part of builders who can suggest what can be done with the old buildings. There are many economies possible and it is hoped that these short cuts will give builders a few hints.

Duplex House Porch and Hall Lights

234 R. P. submits to you a solution of a problem regarding hall lights in duplex houses, as shown. Everybody knows that in two-apartment houses this question always comes up. This solution can be used equally well for a two-story duplex or one-story double house, using the same hall for entrance.

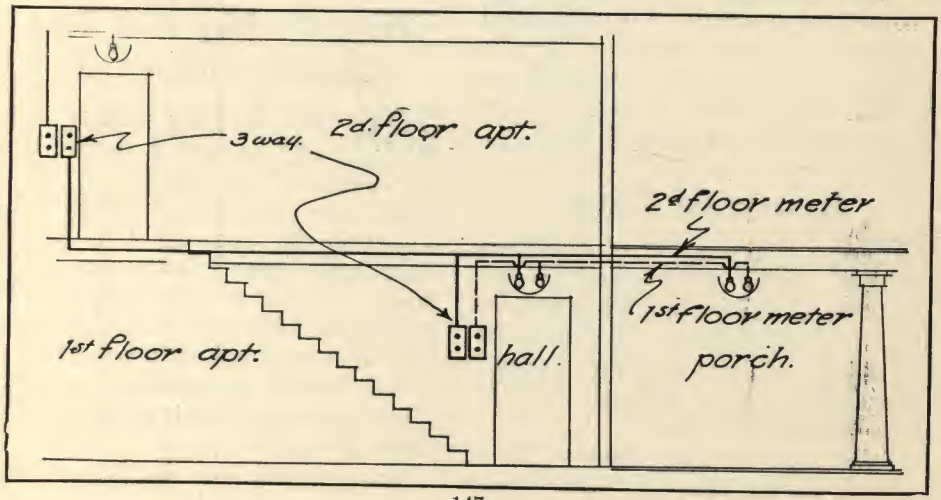
With this solution there is no possible way of disputing whose light is burning or who pays for it, as each tenant controls his own lights with separate switches.

Why couldn't a similar arrangement be used employing one lamp in place of two?

Non-Leaking Speaking Tubes

235 In buildings of the moderate priced class, contractors who install speaking tubes often do a poor job. The joints are sometimes poorly fitted and often very loose, resulting in a leaky line and a tube which does not function properly.

Very little extra care is required to do a good job. It takes but a short



time to fit the joints properly and to tape them as shown in the illustration above. Wrapping tape about the joints will not only make the line leakproof but also will be insurance

against the line breaking at the joints, as sometimes happens.

Since speaking tubes are generally covered up in partitions it is no small matter to make repairs in case a break occurs. Taping the joints, as shown here, will go a long way to make the job a permanent one.

Removing Paint

236 The scraping of hardwood floors with a knife to remove paint and varnish when preparing for a new finish can be eliminated by the use of paint remover, a scrubbing brush, and a package of ordinary kitchen cleanser.

After applying the remover to a section of the floor and thoroughly softening it, wet the brush moderately, dip it in the cleanser and apply to the floor scrubbing vigorously. The action of the water and cleanser will remove all the old stock and leave a clean job. After wiping with clean water the floor will be found to be in prime condition, as the action of the sand acts as a scourer and it seldom needs any further cleaning.

Removing Finish from Old Floors

237 W. D. B., 3142 Boulevard Place, Indianapolis, Ind., sends us a hint which he found of great benefit in refinishing floors one spring. The surfaces of old floors are more or less uneven and a floor scraper will not remove all of the finish.

An easy method of doing this is to apply varnish remover, allow to stand long enough to soften the finish, then use a wire brush such as is used in cleaning stone work. This quickly removes the varnish and whatever dirt may be in the grain of the wood.

How to Buy and Use Shingle Stain Oil

238 The ordinary "shingle stain oil," as sold in drums, is a by-product of gas companies. It is merely the creosote oil which condenses on the inner sides of the gas tanks and runs down the sides. While it is sold by gas companies to those who take the trouble to come after it, for as low as a few cents a gallon, jobbers often resell it to paint stores and roofers for twenty or thirty times the price.

In buying from a local gas com-

pany, it is well to remember that the gas company looks upon creosote as a nuisance. One should provide tight steel drums and should be prompt in bringing them and taking them away.

Coal-tar creosote is rather indefinite in composition. In color, it ranges from transparent amber (it can be colorless) to deep brown, depending on conditions in distilling the gas.

When dipping shingles in "shingle stain oil" the wood should be as dry as possible. Sometimes when creosote is used as a wood preserver, the wood is first treated with vacuum to remove moisture and at about 212 degrees F. subjected to the creosote.

Recommendations for Sheet Rock Wall

239 J. I. W. advises this method of finishing wall board. Fill all joints, nail holes and other defects with plaster of Paris, using care to make an even job. When dry apply a heavy coat of cheap varnish. Before varnish is dry dash clean dry sharp sand into varnish until the desired effect is obtained.

When varnish is dry apply a coat of any good sizing and finish with a coat of oil paint or kalsomine. If properly done the joints will be successfully covered and the whole surface will have the appearance of a sand finished wall.

Do Not Paint Bricks

240 Do not paint the bricks of the foundations of houses. It may add to the appearance—although this is debatable—to put a coat of red or green on when the rest of the house is being painted, but best painters advise against it, for it means damp cellars.

The temperature of a cellar is seldom the same as that of the outdoor air. In summer the cellar is cooler, in winter, warmer. The difference in temperature on either side of the bricks, added to the fact that the larger part of the cellar wall is beneath the ground, makes for dampness within the cellar.

Except after a beating rainstorm, the outside of the bricks will not be damp, because the constant circulation of air outside drys them. Inside, the air is more stagnant. The dampness gathers on the bricks, and, as bricks are porous, soaks into them.

If the bricks are unpainted this dampness is drawn out of the bricks on the outside, and evaporates, with a resulting dry cellar. Paint these bricks and the lead in the paint will fill the pores of the bricks and prevent the dampness from escaping from the bricks to the outside, and that will mean damp walls in the cellar.

It is far better to leave the bricks their natural red and to know the dampness of the cellar has some means of being absorbed into the outer air.

Working Inside and Out

241 Unoccupied buildings lose money for their owners. Every owner wants to have his job completed as soon as possible so that the premises may be occupied and earning money, and the contractor who can get his work done in a short time is often favored. Indeed, most contracts carry the old familiar clause, "Time is the essence of this contract."

On a remodeling job being done in

Boston, Mass., the contractor arranged to wreck the front of the building without making it necessary for the owner to move out merchandise which was stored on the upper floors. Before the work was started the building was partitioned off a short distance in from the front wall by a partition.

This was actually only an ordinary stud partition such as is used on any wall. Next, the joists in the stairway were shored up so that the stairway partition could be wrecked.

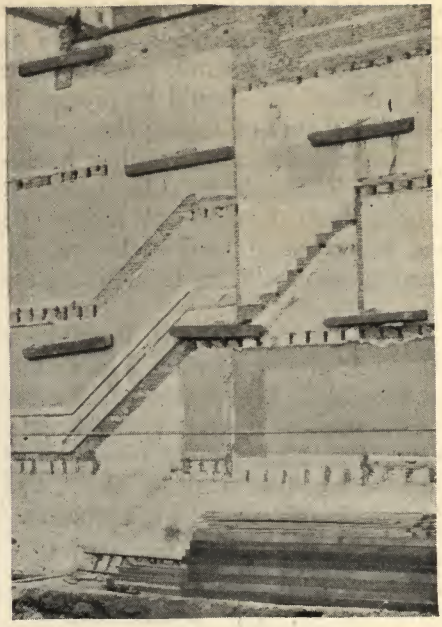
The front wall of the building was wrecked and the debris was carried down to the street in buckets by a stiff-leg derrick mounted on the top of the building. As soon as the wrecking is completed the new front wall will be put in, partitions removed, and business will go on as before.

A Safeguard for the Excavator

242 Underpinning is common practice today and excavations are carried far below the foundations of buildings adjacent to the excavation but where the building next to the excavation happens to be very old and the walls are in an uncertain condition, no effort should be spared to brace the building as solidly as possible in addition to underpinning the foundations.

In the illustration shown here, the contractors were up against the problem of carrying an excavation to a considerable depth below the foundations of an adjacent old building.

About 4 feet back from the inside of the wall cleats were nailed to some of the joists, and short headers were nailed to the cleats. The headers were bored for 1-inch steel rods which ran from the headers through holes drilled in the wall to the outside. On the outside two 3 x 12″s were set against the wall and the rods run through them as shown.



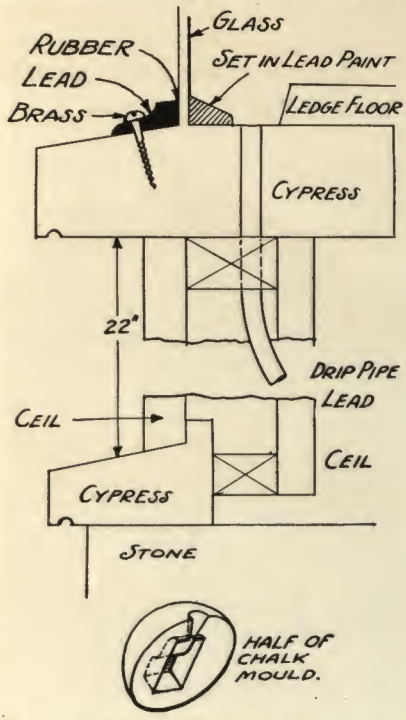
Steel washers and nuts were set on each end of the rods and when the nuts were tightened, the whole arrangement served to provide a firm anchorage for the wall. In order for the wall to overturn it would have been necessary for the entire building to collapse.

Long pieces of 3 x 12″s were used to bear against the wall. This assured a firmer distribution of the load.

New Woodwork Under Plate Glass

243 S. F. B. shows how he put new woodwork under plate glass. The main light was 7 x 8′ and the sidelight 7 x 3′. He took the

work to the shop and next morning got help to take out the glass. He did the woodwork alone and had the glass back in eight hours. The old



side rails were good and he cut them off and brought the new sill up under. The lead mold was made by cutting the shape of the lead in a cake of chalk, then putting another cake against it and poured in the lead.

Renewing the Center Supports of a House

244 The settling down of the center of a house is always due to poor center supports, according to A. G. H. To repair these is very important, otherwise floors and base-boards will separate, cracks will develop in the plaster, and doors and windows get out of true. Floors may become bumpy and uneven.

To do the job properly secure a couple of jacks, and nail some 2 x 4"s together to lift with, and set the jacks a short distance apart. It is often necessary to have two jacks, especially if the main beam which supports the floor joists is divided into two parts by the chimney.

After the jacks are well tightened up the lifting is done very carefully, care being taken to keep both sides even. Only about one-half turn should be made each day. In this way the total lift, say 1 inch, is spread over a little more than a week, allowing plaster to regain its original position without cracking.

As soon as the weight is taken off the old posts, these are sawed off near the floor and removed. Afterwards a concrete pier is put into these holes extending several inches out on the basement floor. These are given time to set thoroughly. Then pieces of asphalt roofing are put on top of the pier and the old posts, cut to proper length, are set in place, being wedged tightly. After this the jacks and supports are removed. This support should last as long as the rest of the building.

Temporary Floor Support

245 It is sometimes necessary to support a wall during the remodeling of a building, and the method shown in the photograph provides a very simple and inexpensive way of doing the work. It consists of nothing more or less than ordinary 2 x 4" studs, spaced the same distance apart as when used in house construction and braced with such odds and ends as may be found on any job.

These 2 x 4" studs rest on a 2 x 4"

sill at the bottom and bear against a 2 x 4″ plate at the top, thus allowing for proper distribution of the

load. The efficiency of this method of temporary support is readily shown by the fact that no cracks are shown in the ceiling plaster.

Supporting Old Roof Trusses During Alterations

246 In Portland, Maine, Di Biase, Chessi & Company secured a job which invoked the remodeling of an old church building. In the course of the work it became necessary to cut the forward roof truss and some method of support had to be devised to carry the roof load at this time. Instead of wrecking the old truss it was decided to support it in place temporarily and when the steel work was set, furnish a permanent column.

Heavy timbers were used and were run up from the level of the basement floor thus supporting the truss from below and leaving the workmen free to wreck the intermediate floors without fear of causing the collapse of the entire building. Notice also that where a portion of the ridge has been cut away, collar beams are used to hold the roof.

A Kink for the Remodeling Contractor

247 The illustration shown next was made on a store-front remodeling job. Instead of building and bracing a scaffold these supports are used in the manner shown, and the time occupied in building the scaffold and the dismantling of it, is saved.

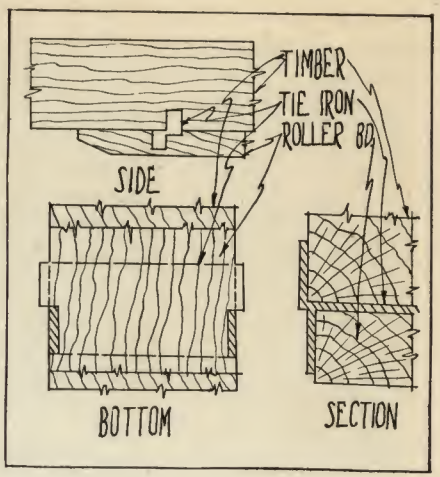
They are built of 2 x 4″'s and the vertical pieces are bored for 1-inch holes spaced 6 inches apart. A ⅞-inch bolt can be slipped through these holes to furnish a support at any level for the 4 x 4″ which holds the scaffold plank. An important item in

connection with this standard is the base. Note how solidly it is constructed and the manner in which it is braced. This is necessary if a firm scaffold is desired.

An Idea For the Housemover

248 Housemoving contractors and anyone else interested in housemoving will find here an idea which may well be followed. It has to do with holding the friction-piece, or the part of the housemoving arrangement which bears on the rollers, fast to the longitudinal timber which supports the structure which is being moved.

Ordinarily a 3 x 12″ is used as the friction piece, or roller board, and is placed between the longitudinal timber of the rollers so that it engages the rollers as the building moves.



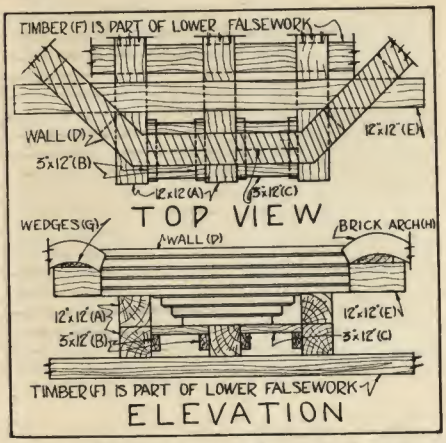
Secure several pieces of scrap iron, ¼ inch thick, and about 3 inches wide. Make them long enough so that when they are bent at the edges as shown in the sketch they will form a lip at least 2 inches long. Split them at the

ends, bending them in opposite directions on each side of the line.

In order to do a good job, the ends should be split just far enough so that the lips can be bent up as required.

Holding a Brick Bay in Moving a House

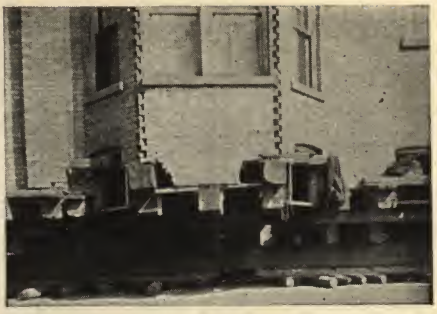
249 The bane of the house-mover's existence is to have to move houses with projections from the main walls. It is always difficult to shore up these projections and to keep them from settling slightly and possibly breaking away from the wall.



For this reason when it becomes necessary to move a house with projecting bays they must be supported in a manner that will prevent their settling and at the same time not interfere with the shoring used for the other portions of the house.

In the method shown here the bay is held on the heavy timbers (A) which are carried on the longitudinal timbers which run the full length of the building. The timbers (A) must be run clear across the building and be set under both opposite walls in order to be stable and firmly held in place.

To the lower timber (A) some 3 x 12″ cleats are nailed (B) on which is carried a shelf of 3 x 12″ which is used to support the part of the brickwork below the arches (H). The dimensions of these members B and C are dependent upon the load to be carried.



The bay above the arches is carried on the timber (E) which is set on top of (A). Wedges are used to help the arches to come to a firm bearing. It is important that this precaution be taken to avoid settling.

It must be understood that for every job, the size of the supporting timbers is entirely dependent upon the weight to be carried and that the sizes given here are safe only for a light load. This same arrangement may be used on heavier work, however, provided heavier members are used in the supporting falsework.

Shoring Support for Stone Sill

250 There are many kinks in the shoring business. Almost every job presents new problems and some of them, though they may not be important in themselves, do play a prominent part when the job is considered as a whole.

This building was supported on shoring to permit the removal of a part of the lower wall and the installation of a steel beam to carry the building above a series of show windows which were to be set in the place occupied by the wall. A short distance above the tops of the

shores was a stone sill and some bracing was necessary to hold the sill in order to keep it from cracking and slipping down.

Before the beam was installed the sill was carried by a 2 x 4″, placed directly underneath it and supported by diagonals, from the shores. After the beam was set, the 2 x 4″ underneath the sill was supported by struts which rested on the I-beam, thus taking a possible side thrust off the shores.

Notice the shoring system. The I-beam above the shores is set underneath the piers between the windows, thus carrying the wall in the most effective manner.

INDEX

250 Short Cuts for Builders

For quick reference we give an alphabetical index of all short cuts. The numbers refer to the number of the Short Cut and not to the page.

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